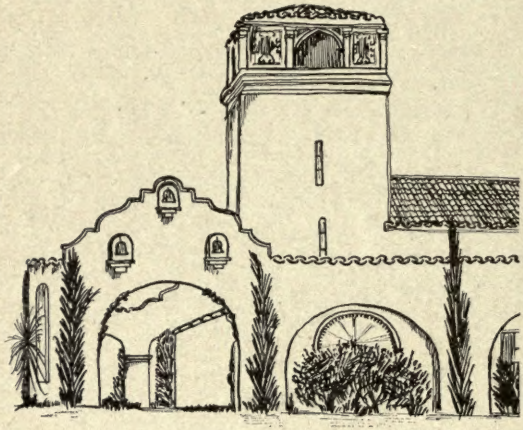
Presented by

Edward S. Merrill, D.O.



COLLEGE OF OSTEOPATHIC PHYSICIANS
AND SURGEONS • LOS ANGELES, CALIFORNIA

E. S. Merrill D.D.

Jan 1915

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/narcoticdrugdise00pettiala

THE NARCOTIC DRUG DISEASES

AND

ALLIED AILMENTS

PATHOLOGY, PATHOGENESIS, and TREATMENT

By

GEO. E. PETTEY, M.D.,

MEMPHIS, TENNESSEE

MEMBER, MEMPHIS AND SHELBY COUNTY MEDICAL SOCIETY, TENNESSEE STATE MEDICAL ASSOCIATION, AMERICAN MEDICAL ASSOCIATION, TRI-STATE MEDICAL ASSOCIATION OF MISSISSIPPI, ARKANSAS, AND TENNESSEE; ALSO MISSISSIPPI VALLEY MEDICAL ASSOCIATION, SOUTHERN MEDICAL ASSOCIATION, AND OF THE AMERICAN SOCIETY FOR THE STUDY OF ALCOHOL AND NARCOTIC DISEASES.

ILLUSTRATED

PHILADELPHIA

F. A. DAVIS COMPANY, PUBLISHERS

1913

WM270
P499n
1913

COPYRIGHT, 1913
BY
GEO. E. PETTEY, M.D.

All Rights Reserved

Philadelphia, Pa., U. S. A.
Press of F. A. Davis Company
1914-1916 Cherry Street

TO the Man who is Helpless and yet Hopes, who Longs for Freedom, who Strives against Odds Unequal while No One Seems to See, or Care to Help, This Book is Offered as a Ground for Hope, a Rift in the Clouds, a Helping Hand.

Z
1913

INTRODUCTORY.

THE conviction, reinforced by long experience, that drug habitués are, in most cases, the blameless victims of disease, and that they not only merit sympathy and consideration, but are entitled to rational and skillful medical aid, such as is accorded the sufferers from other physical ailments, has impelled the author to write and publish this work.

This volume treats narcotic addiction as a disease, a toxemia, of drug, auto- and intestinal origin, the management and treatment of which belong to the field of internal medicine and not to neurology.

The vital and essential principle of the treatment advocated is elimination. This method, with all its auxiliaries, is presented herein in detail, and furnishes a rational basis for the scientific medication and humane management of these cases.

In order to make this monograph of greater direct value to the general practitioner, who may be more concerned with collateral subjects than with the treatment of narcotic addiction, much space is devoted to the treatment of acute ailments occurring in narcotic and alcoholic habitués, to the withdrawal of narcotics after prolonged use during acute ailments, the management of infants born of drug-using mothers, the treatment of

delirium tremens, and "sobering-up" the victims of acute alcoholism.

Certain propositions are so essential to a clear understanding of the subjects considered in this work that the author has thought best to repeat some of these fundamental propositions in the various connections in which they should be considered, rather than to depend upon cross-references. These repetitions will doubtless mar the work in the eyes of a reviewer, but it is confidently believed that this arrangement of the matter more effectively teaches the subject, and makes the volume of more practical value as a reference work than could have been done had cross-references alone been depended upon.

MEMPHIS, TENN. GEO. E. PETTEY.

CONTENTS.

CHAPTER		PAGE
	INTRODUCTORY	v
I.	History, Definitions, Pathology, Etiology	1-27
II.	Symptomatology. Symptoms indicating the use of opiates. Symptoms indicating the use of other drugs with other opiates. Symptoms which indicate the deprivation of the accustomed drug, and others which may be expected to develop under gradual withdrawal. Symptoms which arise under the suppression of opiates	28-50
III.	Treatment	51-79
IV.	Treatment continued. Case reports, etc.	80-96
V.	Treatment continued. Clinical reports, etc.	97-127
VI.	Treatment continued. Treatment of drug disease in pregnant women, etc. Treatment during convalescence of addiction acquired in acute ailment. Structural heart lesions complicating morphinism. Age not a bar to treatment	128-141
VII.	Consideration of remedies used. Purgatives: Physiological laws governing their action	142-167
VIII.	Treatment continued. Remedies employed: Hyoscine, Scopolamine, Daturine, etc.	168-198
IX.	Treatment continued. Remedies employed: Sparteine sulphate, its physiological action and therapeutic use	199-223
X.	Treatment continued. Remedies employed: Gelseminine, Pilocarpine, Aspirin, Hydrochloric acid, Hypnotics, Ergot, Quinine by inunction	224-234
XI.	Physical training	235-260
XII.	Diet during convalescence and afterward	261-274
XIII.	Prognosis	275-284
XIV.	Error in Method. Some reasons for the past failures in the treatment of morphinism	285-302
XV.	A plea for a more just judgment of narcotic drug users	303-323
XVI.	Congenital morphinism with report of cases. Concealed morphinism in parturient women	324-335

CHAPTER PAGE

XVII. The treatment of acute ailments occurring in persons addicted to habitual use of narcotic drugs 336-346

XVIII. Review of Literature. De Quincy's writings: "The Pleasures of Opium"; "The Pains of Opium." Author's comments 347-361

XIX. Review of Literature continued. Erlenmeyer 362-376

XX. Review of Literature continued. Oscar Jennings, Paris, France. Author's comments 377-400

XXI. Review of Literature continued. American writers: Osler; Lambert. Author's comment 401-424

XXII. Cocaine habit. Treatment. Prognosis 425-433

XXIII. Chronic alcoholism. Regular drinkers. Periodical alcoholism. Dipsomania. Causes of alcoholism. Moral cowardice. Instability of character with bad environment. Bad environment with ever-present but resisted appetite. Principles of treatment. Details of treatment. The three-day liquor cure (?) 434-460

XXIV. Chronic alcoholism a disease. Curability 461-475

XXV. Delirium tremens. Etiology. Pathology. Prognosis. Treatment. Results thus far obtained 476-493

XXVI. Treatment of acute ailments occurring in alcoholic subjects 494-504

INDEX 505

CHAPTER I.

HISTORY, DEFINITIONS, PATHOLOGY, ETIOLOGY.

As it is the purpose of the author to make this work one of an intensely practical nature, to record the conclusion of the author based solely upon his own clinical experience, it is not considered in harmony with that purpose to enter upon a lengthy historical consideration of the uses of narcotic drugs. Suffice it to say that the effects of the cruder forms of narcotic drugs were known to the ancients, and these were used from time to time for their pain-relieving and hypnotic effects; but, it is not believed that the habitual use of any of these agents existed to any considerable extent until after the discovery of morphine, the principal alkaloid of opium.

The writings of DeQuincy during the early part of the last century doubtless did more to publish and to popularize the use of opium than any other, or possibly than all other influences had done up to that time. His exaggerated descriptions of the pleasurable effects of opium led many to experiment upon themselves with it, and often these experiments resulted in complete enslavement. These influences, however, led them to the uses of gum opium, or liquid preparation made from it, by the mouth, and the resulting addiction was supposed to depend mainly upon a cultivated appetite for the drug, spoken of usually as a craving. This appetite or craving was regarded as the essential basis of the so-called habit. This was the accepted view up to the time of Magendie.

After the discovery of the alkaloid morphine and the perfection of the hypodermic syringe, Magendie intro-

duced his solution of morphine for hypodermic use, and among the other claims made for this method of administration it was urged that its use, hypodermically, would not produce an addiction, the theory being advanced that, since its use subcutaneously could not create an appetite accompanied by craving for the drug, as such, it did not establish an addiction, or, as it is erroneously spoken of, a habit.

Both the profession and the laity, in following these teachings, found after it was too late that the hypodermic use not only formed an addiction, but that the resulting condition was the worst form of addiction.

The author had, recently, under his care a Harvard graduate who, with a class of four others, became addicted to morphine during the last year of their medical course, they having the assurance of one of the faculty that the use of morphine hypodermically would not produce addiction. Four of this quintet died prematurely, two committing suicide, while the fifth after thirty-seven years of enslavement was finally released by treatment.

These fallacious teachings did much to increase the number of habitual users of opium, but aside from these influences the discovery of morphine and the perfection of the hypodermic syringe have been the greatest factors in extending the use of narcotics.

"In 1864 the first case was reported in which the hypodermic injection of morphine had induced the condition known as morphinism. Dr. Bertrand was the first who published a case in which morphine was used hypodermically, the patient being the wife of Dr. Wood, of Edinburgh, who taught the method to Dr. Bertrand. Dr. Bertrand remarks that Cassargne, in 1836, first recommended such a mode of administration to the Paris Academy. This method, however, soon fell into oblivion,

and was reintroduced by Dr. Wood, of Edinburgh." ("Amer. Text Book of Applied Therapeutics.")

It has only been during the last quarter of a century, however, that narcotic addiction has grown to such proportions as to attract much attention. The evil is now recognized as alarmingly extensive and rapidly spreading. It is hardly profitable, therefore, at this time to consider farther the origin and growth of the addiction. This has been sufficiently done by others.

DEFINITIONS.

The term "morphinism," or morphine disease, is used in this work to include all forms of opium disease. In fact, it is intended in most instances to be the equivalent of narcotic disease. While sixteen alkaloids have been isolated from opium, morphine is present in so much larger quantities, and is so much more potent than any of the other alkaloids, that practically all the medicinal or narcotic effects of that drug are due to the alkaloid morphine.

Whether the addiction be to the habitual use of crude opium or to an extract or tincture made from it, or to the active principle, morphine, or to one of its derivatives, the essential nature of the ailment is the same. Therefore, it is merely a waste of time and unnecessary multiplication of words to consider separately the opium addiction, the laudanum addiction, the morphine addiction, the codeine addiction, the heroin addiction, etc., since, no matter in what form the narcotic is used, the pathology and treatment are practically the same.

The only essential difference presented by users of various preparations of opium is in the time required for the disease to be confirmed, and in the prognosis. One of these differences is that codeine and heroin can be

used for a longer period without formation of addiction than any of the other preparations of opium, and the other is that those addicted to opium smoking are more prone to relapse after being cured than those who use opiates in other forms. With these two modifications borne in mind, the various forms of opium disease may be considered identical. The prolonged use of any drug the effects of which retard excretion of the products of waste results in the formation of an addiction, or, more correctly speaking, causes a disease.

Other Definitions and Distinction of Terms.—Most writers on morphinism use the terms "morphinism" and "morphinomania" interchangeably, as meaning one and the same thing. The author considers this an error. The classes of persons to which these terms should be applied differ widely, and the conditions presented by them differ in etiology, treatment, and prognosis; therefore, each of these terms should be restricted in its use to the particular class of persons to which it properly applies.

Morphinism grows out of the prolonged use of morphine by a person of any type or character; no agency, except the use of the drug, enters into its production. Such a person is properly spoken of as a morphinist. In such cases the use of the drug is begun for the relief of pain; or, inadvertently, without any element of dissipation entering into it. The use of the drug is continued in such cases because of the continuation of the causal suffering or because of the difficulties involved in its renunciation. No mental element which properly could be held to be a mania is present or contributed in any way to the production of the addiction (disease). Probably 75 per cent. of all morphine users in the United States are morphinists.

Morphinomania, on the other hand, not only involves the habitual use of morphine, as in the case of morphinism, but in addition to that a mania for the drug exists. This mania may have arisen from inherited or acquired mental and nervous characteristics, or it may be the product of experiences to which the individual was subjected after the addiction (disease) was formed; but in either case it will be found to be the most troublesome factor during treatment and the one which will most influence the prognosis.

Most emphatically the terms morphinism and morphinomania should not be used interchangeably; the two classes of patients differ in all respects as greatly as do sane and insane persons suffering from any other ailment.

Morphine Habit; Opium Habit.—The author considers it very unfortunate that the terms "morphine habit" and "opium habit" have been, and are still, so universally employed when referring to narcotic addiction (disease). They are misleading and do not, in any wise, accurately describe the condition present.

Habit implies the continued repetition of an act, because it has been so often done before that it does not require a new or repeated exercise of one's volition to accomplish it. The act is automatic or so nearly so that it does not require the conscious act of the will to accomplish it.

Habit is established according to the laws of the transmission of nerve impulses. An impulse in traversing a certain course meets with greater resistance the first time than afterward. The oftener it is repeated, the less resistance it meets in traveling over the same path. As these acts are frequently repeated the impulse travels over this well-worn path with almost no resist-

ance, and then habit is fully established, but all that is necessary to interrupt this course of action and suspend it altogether is the existence or generation of a purpose to have it arrested and the exercise of the will to carry out that purpose.

The exercise of the will alone is sufficient to interrupt and suspend any course of conduct arising entirely from force of habit. That is not true of narcotic disease; therefore, it is not a mere habit and should not be spoken of as such.

The habitual use of the drug is in response to an irresistible demand. That demand is the result of a toxic diathesis produced by the administration of the drug. The condition often exists without any psychological element entering into it, and the patient may bear no moral responsibility with reference to it. He is diseased, and is entitled to the same consideration accorded victims of any other disease.

The repeated administration of narcotic drugs will inevitably result in the demand for continued and constant use. In some cases narcotic drugs may be used repeatedly with a greater degree of safety than in other cases, but this does not alter the fact that the most adamant character and the most superb physique will ultimately succumb to the continued administration of narcotic drugs for an indefinitely prolonged period. Such a condition cannot with justice be called "habit" or "addiction."

The "habit" of using a drug is only a symptom, just as the habit of coughing is a symptom of some chronic ailments. The use of the drug produced the disease; the disease produced the habit.

Why are certain drugs "habit" producing and others non-"habit" producing? Out of the discriminate answer

to this question comes justice to the morphine user and a rational conclusion in regard to therapeutic measures for the aid of the unfortunate.

The entire pharmacopeia can be divided into two classes: the "habit"-producing drugs and the non-"habit"-producing drugs. The first class consists of the narcotics and hypnotics or toxic drugs which render torpid the vital functions of secretion and excretion, resulting in toxemia.

The non-"habit"-producing drugs can be given repeatedly and for prolonged periods without the formation of "habit," and their use can be discontinued without discomfort. They do not lock up the secretions; their use does not produce toxemia and does not result in the formation of "habit." These incontrovertible facts furnish a key to the pathogenesis of the drug habit as well as an index to the therapeutic measures likely to be of greatest service in the treatment of that condition.

PATHOLOGY.

Much confusion has existed and still exists as to the pathology of narcotic addiction. It has usually been classed as a neurosis. Thousands of pages have been written, giving fine-spun theories as to the possible existence of some obscure, undefined brain or nerve lesion which would account for the symptoms attending the use of narcotic drugs, and especially for the symptoms which attend or follow the withdrawal of narcotics from those addicted to their use.

The resources of the microscope and of the clinical laboratory have been exhausted in an effort to demonstrate the presence of such a structural lesion, but without avail. The only structural lesions that have been demonstrated in these conditions are the changes in the

blood, and these do not differ from those existing in other anemic conditions. Most medical writers, not accepting these fine-spun theories of neurologists, dismiss this part of their subject with the statement that the pathology is *nil.*

The structural pathologists, those who insist that every pathological condition is the result of a structural lesion, have had the ear of the profession, and have so dominated professional opinion during the last half-century, that few men have been bold enough to insist that a real pathological condition could exist without an underlying or attending structural lesion.

During the last few years, however, professional opinion has undergone a considerable change and it is not at this time considered *lese-majesty* to say that a disease may be purely functional and yet be of such gravity as not only to require active treatment, but to cause death, if not so treated.

Those who have studied the subject have been confronted by conditions which they have interpreted in divers ways, but in their efforts to reason backward from effect to cause they have been lost in the hazy marsh of superstition as completely as those who wrote on malaria and yellow fever a generation ago. Their bewilderment was increased and the truth longer concealed by the dogmatic teaching of structural pathologists.

Writers on drug addiction (disease), being guided by such teachings, have striven in every way to demonstrate a structural lesion in drug addiction. Every structure of the body has been minutely examined, but the microscope has steadily refused to verify the presence of any lesion which would account for the conditions present. The manifestations which were most prominent being of a nervous character, some obscure lesion

of the nervous system has been supposed to exist, but no one has been able to demonstrate its presence.

At this point, writers have diverged in their views. Some, while being unable to demonstrate the presence of a structural pathology, have still held that it did exist, and that this obscure, undefinable, undemonstrable lesion was the cause of all the manifestations of disease seen in these cases. Being uncertain as to pathology, their suggestions as to treatment were as full of unreason and superstition as their views of pathology were vague. They, however, took refuge in a generic term, neurosis, and classed these addictions as such and advised symptomatic treatment.

The nervous manifestations presented in these cases were so nearly innumerable and so mystifying that the practical man who attempted to treat a patient of this class symptomatically soon found himself in deep water, and very shortly would throw up his hands in horror and cry out with Da Costa and others, "There is no remedy for the opiate habit," and "There is no help for the widow's son." Those who held the views of writers of this class, practically, gave up these cases as hopelessly incurable.

Other writers, more materialistic, but less consistent, not recognizing any other than a structural pathology for disease, and being unable to demonstrate the presence of a structural lesion in narcotic addiction (disease), took the position that there was no pathology. Writers of this class dismiss that part of the subject with a sweeping statement couched in four words, "The pathology is *nil.*"

These writers, however, were still confronted with the manifestations attending the uses of narcotic drugs. They were still confronted by living facts for which they

must account in some way. In an effort to escape from this dilemma they took refuge in the word "vice." They therefore classed narcotic-drug addiction as a mere vice, a perversion of the will, a degenerate state into which the victim entered from choice, claiming that in pursuing such a course he was prompted or led by inherited or acquired degeneracy, asserting that all who fell into the use of narcotic drugs were, primarily, neurotic weaklings who, by yielding to the influence of the drug, had been made doubly unreliable. They made free use of such terms as "perverts," "fiends," "inveterate liars," etc., and classed every drug user as one who had willfully yielded his God-given powers of self-control, and voluntarily accepted the dominion of a mere vice. These views are not tenable.

While it is true that many nervous manifestations attend the use of narcotics, and especially the disuse of narcotics by those who are habituated to their use, still the condition is not in any sense a true neurosis; *but it is purely and solely a toxemia, and as such it belongs to the field of internal medicine and not to neurology.*

The author is aware that this classification will be objected to, but it is confidently believed that before this treatise shall have been completed the evidence produced will be such as to sustain his position.

There is as much reason to classify typhoid fever as a neurosis as there is to classify narcotic-drug addiction (disease) as such. The exaggerated nervous condition manifested by typhoid patients is equally as marked as that seen in drug addiction, yet we know that typhoid fever is an infection and a toxemia combined.

More than ten years ago the author reached the conclusion that *the essential pathology of narcotic-drug ad-*

diction (disease) is a toxemia, a toxemia of drug, auto-, and intestinal origin.

This view was the outcome of the study and treatment of about 150 drug patients. But, while the proposition was then announced, its full significance was not really comprehended. Clinical observation made during the treatment of more than 3000 patients of this class since that time has given the author ample opportunity to verify, in every detail, the claim then made.

The author feels fully warranted in saying that every symptom attendant upon the use or the disuse of a narcotic drug is the direct outcome of drug, auto-, and intestinal toxemia. Just in proportion to which the toxic condition of the system is overcome, all these nervous manifestations disappear.

It is the belief of the author that if a drug patient could be made *cell clean,* that is, if every cell and structure of the body could be entirely freed from toxic matter, there would be no nervous manifestations or suffering incident to or following the withdrawal of narcotics from an habitue.

It is impossible to perfectly cleanse the system of a drug user, so long as any quantity of the drug is taken. Still, the nearer this ideal condition is approached, the less suffering accompanies or follows the withdrawal of the opiate.

While we have been unable, by laboratory methods, to demonstrate the pathology of morphinism, we have reached the conclusion by clinical experience, acquired in handling a wide and varied series of narcotic patients, that this view of the pathology is unquestionably correct. In such circumstances as this, where we have not the data to enable us to reason from cause to effect, the most practical mode open to us of studying such questions, is to reason backward from effect to cause.

If in pursuing this course with reference to the pathology of narcotic-drug addiction (disease), we take up the impressions made by the narcotic on the system and analyze them, we find the following conditions to exist: The first dose of morphine brings about a state of quietude or torpor which is soon succeeded by sleep, accompanied by diminished or completely arrested peristaltic action. This is followed by constipation, with reduced activity of all the secreting and excreting glands. In the course of from eight to twelve hours the hypnotic effect and most of the other effects have subsided, and the functional activity of the system has become normal, and possibly secretion and excretion are carried on at a slightly accelerated rate; but it requires several days for this increased activity of the excreting organs to free the system from the products of wastes which should have been eliminated during the time these functions were retarded by the benumbing influence of the narcotic.

Now, if before that is accomplished another dose of the drug is taken, the eliminating organs are again interfered with in their work, and if this is repeated from day to day the system soon becomes surcharged with the products of tissue disintegration and their fermentative compound.

These waste products play a much more important role in causing the difficult complications met upon the withdrawal of morphine, known as abstinence symptoms, than does the drug itself. After the use of the drug is kept up for a time, upon examination of the patient, we find the skin dry and crusty, the tongue coated, breath foul, bowels habitually constipated, digestion impaired, heart action defective, and other evidences of portal engorgement.

When the administration of the drug is discontinued and the patient is allowed to go for a time without it, some of these symptoms give way to others of a different character, while others of them are merely intensified, but not changed in character. The dry skin gives way to excessive sweating, the constipation to diarrhea, colic, nausea, and other evidence of gastrointestinal disorder. With this clinical picture before us, we could arrive at no other conclusion but that the patient's system was intensely saturated with toxins of intestinal and auto-origin.

With toxins existing in the system to the degree indicated by this clinical picture, we should have no difficulty in accounting for the perverted functional activity of every organ in the body, as well as for the various and sundry nervous manifestations incident to the withdrawal of the drug. So long as the drug is taken at regular intervals, in the accustomed dose, the nerve centers are kept benumbed so as not to be responsive to the irritating effects of this toxic accumulation. But if the drug is withheld in whole or in part the nervous system soon becomes sensitive and therefore responsive to toxic irritation, and various functional derangements are at once apparent.

Among the early symptoms incident to the withdrawal is a slight rising of temperature, and as the hours following the withdrawal of the drug pass this temperature rise increases, and if left uncontrolled will run to very high degrees. This fever is accompanied by the most intense aching of the bones, limbs, and in fact every part of the body is in more or less discomfort. Every nerve in the body seems to be on the outside and as if it were being lacerated by some instrument of torture.

Appearing about the same time as the beginning of this rise of temperature can be noted a zone of uneasiness

about the umbilicus, known as colic. This increases as the system becomes less and less under the influence of the drug until the pain is distressing. The heart action grows much more rapid and the pulse is small and jerky. This difficult heart action is usually attended by excessive sweating, intermittent in type, resembling to some extent intermittent fever, that is, the skin will be dry and there will be an abrupt rise of temperature due to the irritative effects of the toxins, and this seems to overpower the heart and the circulation becomes deficient, and then the body soon becomes bathed in a cold, clammy sweat, during which there is a recession of the fever.

Nausea and vomiting usually precede or appear synchronously with the excessive diaphoresis and persistently continue until some relief of the engorged condition of the gastrointestinal system is effected. If diarrhea sets in, the nausea will not be so marked, but so long as the bowel is not moving freely the vomiting continues and often becomes stercoraceous.

The suffering of the patient under such circumstances is extreme, and it could not be expected that one would stand so intense suffering without doing anything in his power to obtain relief. This urgent physical demand for the quieting effects of the narcotic has been interpreted as being a mania for the drug, but it should not be so classed.

These symptoms have a real physical basis.

In examining more minutely into the condition of the various organs we find that the activity of the liver and intestinal glands is diminished. The rhythmic motion of the intestines is suspended, alvine dejections are arrested, and the excretion of urea is slightly decreased.

The effects of the drug, continually used, result in the retention of a large percentage of the products of

tissue waste. The presence of this excrementitious matter in the system leads to the formation of ptomaines and other ferments, digestion and assimilation are thereby much impaired, and the victim soon becomes intensely self-poisoned and, later, profoundly anemic.

The nervous system under the constant influence of this toxic matter becomes unsteady and irritable, and in a short time the patient presents a picture of an aged, neurotic, anemic wreck.

From a grosser anatomical standpoint, no structural lesions result from the prolonged use of opiates, but a careful physical examination reveals unmistakable evidence of the most widespread functional derangements: the blood is thin and deficient in the oxygen-carrying red corpuscles; the mucous membranes are pale,—in fact, all the structures show signs of profound anemia; the abdomen is full and unduly indurated; the liver is enlarged and the portal system engorged; tongue coated; breath foul; skin alternately dry or excessively active, but always swarthy and yellow; heart action variable, depending upon the stage of narcotic impression; nervous reflexes either blunted or exaggerated; the muscles are flabby and relaxed; the memory is impaired; mind inactive, and the entire bearing of the patient is one of dejection and hopelessness.

To sum up, the evidence clearly indicates a condition of intense intoxication, with profound anemia, attended by derangement of the nervous system and impaired mentality.

The powers of perception are materially blunted, and actions based on *perception* may not represent the real intent of the individual, because erroneous conclusions are likely to be drawn from these impressions; actions based upon such conclusions would be correspondingly

erroneous or untrue to the real intent of the individual, but actions arising from a *concept* do usually represent the real purposes of the individual.

A person in such condition is unable to acquire new facts for the reason that the perceptive faculties—in fact, the entire nervous system—are so blunted that impressions coming from without are not distinctly perceived, and, as these are received in a blurred and indistinct manner, they are not registered with such completeness as to be recalled accurately by a future effort of the memory. It is almost out of the question for one in this condition to memorize any composition, or to recall with perfect accuracy impressions received from without.

This defect, or inability to reproduce accurately impressions received from without, has done much to create the impression that all drug habitues are notoriously untruthful. This, as applied to many of them, is an unjust accusation.

It is true that many drug habitues do not make any approach to truthfulness, but, when the influences under which this state of affairs has developed are considered, it will be found that many influences other than the effects of the drug itself have contributed to the development of their untruthful habits. This phase of the subject, however, will be more fully considered in a later chapter of this work.

The most satisfactory evidence of the correctness of the views of the pathology of narcotic addiction (disease), herein stated, will be found in the results of the treatment based on such views. This evidence will be presented in detail in the chapters on Treatment.

If the long sought for brain or nerve lesion exists as a pathological factor in these cases all evidence of its existence certainly disappears under rational treat-

ment based upon the pathology herein defined. Since the cure of the patient is the object of this study, and since this is accomplished by treatment based on the views herein stated, the author has no inclination to enter into a "hair-splitting" discussion as to the possibilities of the existence of a disease without an underlying structural lesion.

ETIOLOGY.

The alarming rate at which the habitual use of narcotic drugs has increased during the last four decades is a matter which should give us the deepest concern. Two or three factors have contributed to this result. The first and most important is the popularizing of the hypodermic syringe which has occurred during that time.

Before the introduction of the hypodermic syringe, people had not been taught to expect immediate relief as soon as the physician arrived. Then, the physician was free to administer such remedies as were indicated, and the patient had no other idea than that he must wait a reasonable time for relief from them.

But during recent years the people have been taught to expect relief from pain as soon as the physician arrives. They understand that he can give a hypodermic dose and immediate arrest of pain will follow. This demand is so urgent and universal that many physicians fail to withstand it. Every physician understands that if he refuses to yield, another may be called in his stead who will do so. As he does not wish to surrender his case to a competitor, he feels almost compelled to comply with the demand of the patient or his friends for immediate relief. He gives the soothing potion, and thus unwittingly contributes his moiety to the education of the public in the wrong direction.

Should the patient's ailment be a chronic and painful one, the repetition of these doses often leads to complete enslavement. A majority of the victims of narcotic drugs among the laity trace their addiction to the administration of drugs by a physician.

It should be a universal rule, however, among physicians to use an opiate only where one or two doses will suffice. When the ailment is a chronic painful one it is worse than folly to begin to relieve that pain with an opiate. This should not be done, not only because it generally leads to enslavement, but because it is not a curative treatment. On the contrary, opiates check secretion, and therefore perpetuate and aggravate any existing painful ailment.

But, so long as people imperatively insist on being given relief as soon as the physician reaches the house, patients will be called upon to suffer the consequences of their unreasonable demand.

Conditions which predispose to the use of narcotics may be either physical, mental, moral, or accidental. The time required to develop a confirmed addiction (disease) varies greatly in different individuals; but, it may be said with certainty that any human being will become addicted to opiates if these are used continuously for any considerable length of time.

In the average Caucasian thirty days' daily use is enough to establish the addiction (disease) to such a degree that very few persons would be able to extricate themselves from it by their own efforts. If the daily use be continued as much as three or four months, it is almost impossible for one to stop its use without active treatment. A few persons, usually women, have used an opiate as much as four to six months and then voluntarily given it up without aid from others. But, while

one succeeds in such an undertaking, hundreds, and even thousands, fail.

Among the physical ailments which have contributed largely to the formation of a drug addiction (disease), we mention chronic rheumatism, migraine, hepatic and renal colic, asthma, chronic dysentery, hookworm, pellagra, threatened abortion, tuberculosis, cancer; alcoholism, especially periodic alcoholism; unstable nervous organizations, other painful ailments, autointoxication, exhaustion, overwork.

The use of opiates in such ailments as chronic rheumatism and migraine should never be thought of. Rheumatism, if not due to, is certainly intensified by, toxins produced in the system. Opiates make the elimination of these products more difficult and, therefore, necessarily increase rheumatic symptoms. The same may be said of migraine and asthma. While a single dose of morphine gives the most prompt relief, it is a dangerous thing to allow the patient to know a drug of this character is being given him, as he is too liable to secure and take that drug without calling a physician and, therefore, too frequently, and is very liable to become addicted to the use of it.

Chronic dysentery is one ailment in which an opiate is frequently helpful and, if used to a limited extent, would be justifiable; but, it must be remembered that merely checking the bowel does not cure the ailment.

The use of opiates for the relief of hepatic and renal colic is justifiable. These ailments are of such extremely painful nature and are usually of such short duration that a few doses of opium are sufficient to tide the patient over one of the acute attacks.

Not only so, but an opiate is really curative in these attacks, that is, it is curative in the sense that it aids in

cutting short the acute attack of colic. By relieving pain and rendering less sensitive the nerves in the duct in which the missile is lodged, the chronic state of spasms is overcome, and this will often allow the duct to dilate to such an extent as to admit of the passage of the stone which is causing the pain. While opium is not the best agent for this purpose, it is one that does give relief, and shortens the attack.

About the only chronic ailment in which the author would justify the use of opiates is in cancer after it has passed the operable stage. When it is seen that the patient cannot be cured, then the physician should give him anything that will contribute to his comfort during the time he must remain alive. For this purpose the free use of opiates is justifiable even if confirmed addiction should be established by it.

In such cases the patient's life can be prolonged only for a short time, and the fact that he must use an opiate every day does not materially injure him, and if it gives him some comfort he is entitled to it. Therefore, without regard to the formation of the addiction the opiate should be given as freely as his condition demands. In all other chronic painful ailments the use of opiates should be avoided.

Inordinate ambition, overwork, and insufficient rest have been the cause, however, of a very large percentage of addictions, especially among medical men.

Among the mental and moral conditions predisposing to the formation of narcotic-drug addiction, we might mention lack of conviction, low ideals, moral cowardice, self-centered life, softness, overindulgence by parents, indifference to the obligations common to all humanity, living for the gratification of the present moment, low and inadequate views as to the meaning, or obligations, of life, overconfidence, and inordinate ambition.

Instability of character with deficient convictions are important defects in anyone, and expose such a one to many dangers as he passes through life. The man with positive traits of character, fixed habits, and strong convictions as to what is right and wrong, and who has a keen sense of his obligation to humanity, will, by the mere possession of these opinions and convictions, be protected from many of the snares and pitfalls that inevitably await those who are less fixed in their habits and convictions.

If the purposes and conduct of those who take up the use of narcotic as a dissipation be analyzed, it will be found that selfishness lies at the center of most of their actions; in fact, their lives are self-centered. Everything points to something for themselves. They live for the gratification of the present moment, almost exclusively.

Persons of this type have so little moral purpose, so little kindness, and so little care for anything but themselves that they are unwilling to suffer even for one moment. If the slightest ailment occurs they consider it the most important thing in life, and as it affects them it appears to them to be a mountain and must be relieved at once at all hazards. This exalted estimation of their own personality leads them into many errors, as well as many dangers.

If it happens that they are attacked by a painful ailment of any kind, their urgent insistence upon immediate relief at all hazards leads almost inevitably to drug slavery. Opiates have a very seductive effect on such persons. They are usually out of harmony with themselves and everything surrounding them. The effects of opium relieve this discordant condition and bring them somewhat into harmony with their environments,

and to them this is a most delightful experience. They are, therefore, very prone to fall a victim to narcotic drugs.

Among the accidental causes which lead to the formation of narcotic addiction is the use of proprietary medicines. Prior to the enactment of the Pure Food Law nostrums were put up without formulæ, or other evidence of their composition, but recommended for various ailments. Many of these preparations contained narcotics in sufficient quantities to establish an addiction in a short time. The cough mixtures, the consumptive cures, the asthma cures, etc., almost all contained opiates, and if used for any considerable length of time an addiction resulted.

These compounds were used, as a rule, without the knowledge on the part of the person using them that they contained an opiate; therefore, an addiction resulting from their use was purely accidental. That is, there was no purpose on the part of the individual to take the opiate and, therefore, no moral guilt or responsibility entered into the formation of the addiction.

Again, one who is afflicted with some painful ailment and under the care of a physician, and that physician administers to him an opiate for a prolonged period without the patient knowing what he is taking, he is thus, day by day, being entrapped into a web that may enslave him for life. One who becomes addicted under such circumstances is not in any wise to blame.

Physicians have not understood the danger of this course and frequently will give opiates to patients for several months until a painful ailment has subsided, then discharge them with the advice that they do not need further treatment. This leaves the patient to fight out the battle for freedom without the aid and direction of

the proper advisor. If the patient has become aware of the fact that an opiate was what was being given him, he will almost certainly secure a supply and continue to use it, notwithstanding the physician's advice that it must be stopped. This is the true history of addiction in many cases.

The length of time which an opiate may be taken before addiction is confirmed—the disease really established—depends not only upon the peculiarities of the persons themselves, but also upon the manner in which the opiate is taken and on the preparation of the opiate taken.

Crude opium and laudanum taken by the mouth are absorbed more slowly than the other preparations of opium and, therefore, the narcotic impression is not as pronounced at any stage of the effect. These can be taken, in this manner, for a longer period than morphine could be taken, without forming an addiction.

Morphine can also be taken by the mouth for somewhat longer periods without forming a confirmed addiction than it can be when used hypodermically. The hypodermic use brings about a very prompt and profound impression, and all the secretory and excretory organs are greatly restricted in their action. This retardation of excretion causes the rapid development of the toxic condition upon which confirm addiction rests.

Codeine and heroin, on the other hand, check secretion less than any other forms of opium, and because of that fact they do not cause such rapid intestinal and auto toxemia. They can be taken or given for a longer time than any other form of opiate without establishing a confirmed addiction.

But, any narcotic taken habitually will form a confirmed addiction (disease). In this list we must include,

in addition to opium and its derivatives, chloral, chloroform, atropine, hyoscine, scopolamine,—in fact, all of the belladonna series of active principles. All these are narcotic in their effect; they all check secretion, and, therefore, bring about the toxic condition which is, in fact, the essential pathology of the narcotic disease, and all drugs which retard the excretion of the products of waste will, if taken a sufficient length of time, result in addiction (disease).

Many of the members of our own profession are falling victims to drugs also. The use of narcotics has increased even more rapidly among the profession than among the laity.

It would seem that, of all persons, the physician should be the last to fall into such a snare; that his professional training, his knowledge of the evil consequences of the use of narcotics, should effectively fortify him against their use. The facts, however, do not bear out that idea.

A much larger percentage of physicians is addicted to drugs than is found among members of any other profession or calling. Let us see if we can reach some rational conclusion as to why this is the case.

Unfortunately, many persons enter the profession of medicine, as they enter other callings, without definitely fixed convictions upon fundamental questions. In the life of every man there should be a few questions, at least, which are settled for all time to come.

Among these should be his accountability to his Creator, loyalty to the flag of his country, confidence in the honor of his father and the virtue of his mother, and his determination to maintain his own fidelity to his wife. These questions should be so fully settled as not to be open to debate even with himself.

For one entering upon the practice of medicine, the author would add to this a fixed conviction that one who lives by his brain must not work under stimulation, that he cannot afford to lengthen his working hours by the use of stimulants.

One entering the profession without definite convictions on this point allows circumstances to dictate his course. If he is well qualified and energetic, and settles in a community where his services are in demand, in a few years he builds up a practice which taxes his strength. Coming in after a full day's work he finds other calls awaiting him. He is tired—in fact, his strength is exhausted, and he should not undertake more, but he reasons that some of these calls are from people whom he cannot afford to turn away, that he must answer them.

In order to whip up his flagging energies so as to enable him to meet these extra calls, he takes a stimulant. Yielding to this temptation is often the first step toward ruin. If he is brainy and effective, his work not only continues, but grows, and he is frequently confronted by emergencies which call for the expenditure of more strength than he has, and, from time to time, he resorts to stimulants of one kind and another to enable him to meet them.

Whisky is usually taken for a while, but that soon begins to show on him, and its telltale odor on his breath is something he would like to avoid. In seeking something to take its place, an eighth of a grain of morphine is tried. This overcomes the sense of fatigue, and tides over the emergency more satisfactorily than whisky did, and, apparently, does not have as bad after-effects.

His work increases and a demand for longer working hours continues to come, and he finds himself resort-

ing to the stimulant more and more often. Then he begins to think about the matter, and asks himself the question: "Am I taking any risk in doing this? It is true that I would not advise anyone else to do as I am doing; but, I have perfect control of myself,—in fact, I know myself, and I can take it or not, just as I wish."

He tries this, and the fact that he can, at this stage, take it or leave it alone leads him to feel that he is entire master of the situation, and in that belief he goes on taking a dose occasionally, and at other times refraining from doing so, but always fully confident of his own power of self-control. Thus, his overconfidence in himself, coupled with a lack of convictions, leads him to resort to the drug to lengthen out his working hours and to sustain him in every emergency, either real or imaginary, until, before he is aware of it, he has reached a stage where he finds himself unable to do his work without the support of an artificial stimulant.

At this stage he could still stop the use of the drug if he would quit work, but he feels totally unequal to the tasks before him unless he has the support of a stimulant.

He realizes that he should go away for a rest, but if he goes away his clientele will fall into the hands of his rival, and he thinks he cannot afford to allow that, or, possibly, he is in a section where there is no one to take his place, he has some very sick patients on hand, and he feels that their lives would be jeopardized by his leaving just at that time, or his obstetric engagements are such that he could not get away without leaving them provided for.

Reasoning thus, he continues to work under stimulation and to put off to a "more convenient season" taking the rest which would enable him to stop the stimulant,

until, before he realizes it, he has passed the point at which he could stop it even by quitting work; in fact, he has inadvertently woven around himself chains which he is in no wise able to break. He is a helpless victim in the hands of a monster with whom he is unable to cope.

This is, in substance, the history of probably 75 per cent. of professional men who have fallen victims to morphine. These victims have been drawn from among our most talented and active men, and this has occurred, as a rule, during the first ten years of their practice.

Now, the motives that prompted this course were not vicious; neither did real elements of dissipation enter into it. It is not just to class these men as perverts and to stigmatize them as fiends, to brush them aside as men who are willfully abandoned to a loathsome habit, which they could quit if they would. Their numbers are too great, and they come from too respectable a source to be either abandoned or condemned without justice or reason.

The only blameworthy elements that entered into their enslavement were, first, lack of fixed convictions as to the use of stimulants, overconfidence in their powers of self-control, with probably an inordinate ambition. These, conspiring together, led the victim, unawares, to hopeless slavery.

The number of persons in this country who become addicted to narcotics as a real dissipation is comparatively small. The indiscreet use of the drug for the relief of pain is the chief cause of the addiction (disease) among the laity, and its use by physicians to enable them to work longer hours accounts for it in a majority of instances where professional men are involved.

CHAPTER II.

SYMPTOMATOLOGY

In order to convey a clear idea of the symptoms of narcotic drug disease, it is necessary to divide and classify them with reference to the stages of the disease. It will be well to consider them under the headings of symptoms which indicate the use of opiates in small quantities; also in large quantities.

Symptoms which indicate the deprivation of the accustomed drug.

Symptoms which indicate the use of other drugs with the opiate, such as cocaine, atropine, scopolamine, etc.

Symptoms which may be expected to develop under the different forms of treatment used to cure the disease, both during treatment and during convalescence.

SYMPTOMS INDICATING THE USE OF OPIUM.

The easiest and most commonly noticed symptom which would indicate the use of an opiate is contraction of the pupil. The normal pupil accommodates itself to the variations of light, and if one in a normal condition is placed where the light is dim, or it is comparatively dark, the normal pupil dilates in order to admit as much light as possible. But, when the light is turned on, the pupil contracts at once so as to exclude an excess of light. This normal activity of the pupil is well understood, but in drug users the power of accommodation is often almost entirely suspended.

Under the stimulating effects of the opiate the pupil is contracted, and, even if light be excluded, the pupil

does not dilate to any considerable extent, and, upon turning the light on, the degree of change in the size of the pupil is less than in a normal person. This is regarded as one of the most certain signs of the use of a narcotic.

The condition of the pupil, however, varies much with different stages of narcotic impression. Soon after taking the opium the pupil is minutely contracted, and remains so during the active stimulating period of this narcotic impression. But, as the effect of the drug dies away, the pupil dilates, and if no repetition of the dose is made within, say, twenty-four hours the pupil will be found at the end of that time to be larger than normal. Under the stimulation the period of contraction lasts for a time, but, upon the waning of stimulation, the pendulum swings the other way, and the pupil is abnormally large for a time.

Upon the cessation of the use of the opiate the pupil will soon regain its normal accommodation. But, in drug users, these doses are repeated daily, or sometimes a number of times during the day, and the pupil, therefore, is kept contracted most of the time, and this gives the eye of an opium user a dull, lifeless appearance.

A convenient method of testing the reaction of the pupil to light is to place the hand tightly over the eye and hold it there for about a half-minute, then quickly remove the hand. If the pupil does not contract when the light is allowed to come in contact with the eye, it is evident that the eye is not in a normal condition.

In order to conceal this telltale symptom—the contracted pupil—drug users frequently combine some mydriatic drug with the opiate they are taking, usually a little cocaine, or atropine, or hyoscine. These, if taken in small quantities with the opiate, have a tendency to

dilate the pupil, thus counteracting to a great degree the effect of the opiate on the pupil; therefore, in such cases one may be deceived as to the condition when judging from the pupil only.

However, even in these cases, although the pupil may be as large as normal, if the light test be tried upon the patient, it will be found that the pupillary reaction is distinctly modified. Under the blunting effects of the narcotic the responsiveness of the reflexes is reduced and the pupil will not react normally to light when the patient is under the influence of a drug, notwithstanding that one of the drugs may have a tendency to dilate, and the other to contract, the pupil.

Another very characteristic symptom of drug users is the variability of their mood. Persons who take the drug are usually exhilarated during the early hours of the narcotic impression, but this is followed by depression of spirits, or even moroseness, as the effect of the drug passes away. Therefore when a man varies in mood from hour to hour it is a strong indication that he is being influenced by some drug.

This variable mood will often manifest itself in excessive talkativeness, during the period of the early or stimulating effects of the drug, and this will be succeeded by an undue reticence or quietude, as the drug dies away. Such a person, at this stage of the narcotic impression, may be seen to retire from the company, to come back in half an hour full of life and spirits. These variable moods are, almost certainly, due to the effect of some drug.

Drowsiness or a tendency to sleep is also one of the effects of the drug, but this does not come on at the same stage of narcotic impression in all individuals. That is to say, the primary effect of the opiate brings on a

condition of sleepiness in some persons, while others are made wide-awake and active during the early impression of a narcotic, only to become drowsy, or intensely sleepy, as the effect wears away. This depends upon the personal peculiarity of the individual.

Another symptom, usually present, which indicates the use of an opiate is itching of the nose. This is shown by an almost constant desire to scratch or rub the end of the nose. This is much more marked in the earlier period of the use of the drug than later. A symptom which appears at a later date is a peculiar harshness of the voice. This is more noticeable at some hours of the day than at others, depending upon the stage of narcotic impression.

Another symptom which is of diagnostic value is the absence of sneezing. Persons who use an opiate habitually do not sneeze, that is, they do not sneeze so long as they take the opiate regularly, but if they are deprived of the drug so that they go several hours beyond the time for taking their dose they will begin to sneeze and the sneezing will be persistent and frequent until it is arrested by the effects of another dose. When they are uniformly impressed with their drug it is almost impossible to make them sneeze by the application of snuff or other irritant to the Schneiderian membrane.

The condition of the skin also shows evidences of the use of narcotics, if that structure be carefully observed at different stages of the narcotic impression and at different hours of the day. The effect of the narcotic at first is to dry the skin, but as the primary effects wear away there is a disposition to sweat. Therefore, perspiration occurring at intervals and at times and under conditions when others do not perspire is a symptom which strongly indicates the use of a narcotic.

There are exceptions to this rule, but they are comparatively rare. It will be found that for several hours after the usual dose of drug has been taken the skin is dry, but, as the drug effect wanes, perspiration begins and, from that time until the next regular period for taking the drug, the skin is moist, and, if the patient goes much beyond the fixed time before taking his dose, perspiration becomes excessive. Therefore, this variable activity of the skin is an indication of the use of narcotics.

However, all these symptoms may mislead and it may at times become the duty of the physician to determine with certainty whether or not a given individual is really addicted to a narcotic drug. By applying what might be called the *crucial test,* one who is familiar with such matters can determine with certainty, in a few days' time, whether or not the suspected individual is, or is not, addicted to a narcotic drug.

To make this test, the following steps should be taken: Let the suspected person be turned over to a nurse who is absolutely reliable. Let the patient be taken to a bathroom, stripped, and given a bath, and while he is in the bathtub let the nurse take the clothing he has been wearing, including hat, shoes, and underwear, and remove them from the room and put in a locker. When the bath is completed, furnish the patient with nightshirt or gown and then take him to a room in which he has never been before and put him to bed. If patient is a woman her hair must be taken down and all artificial hair, etc., removed.

Let a watch be placed over him, to the end that it be made impossible for him to secure a drug, and let his conduct be observed. If he is not addicted to a narcotic drug he will pass the time in comfort just as any other

normal person would do. If he is addicted to a drug, the time for his accustomed dose will soon approach. Up to that time, there would usually be no evidence of his addiction. But, as this time arrives, he will begin to show signs of nervousness or restlessness.

These may be concealed for a few hours beyond the time for his accustomed dose; but when that time has passed and the physical demand for the drug begins to make itself felt, if he is addicted to an opiate, there will certainly be reactionary symptoms which cannot be concealed. The skin of the patient will become unduly moist, his pulse rate will be greater than normal, and, in six to eight hours after the time at which he has been accustomed to take the dose, the temperature will begin to rise and will continue to rise until there is a distinct fever.

The patient will be restless, nervous, and despondent; will complain of pain in the limbs and back, with more or less inclination to colicky pain in the bowels, and, if the addiction is at all well established, nausea will soon make its appearance. And, before this test has been carried much further, the patient will most likely be led to confess the truth.

But if he stands this test for forty-eight hours without showing reactionary symptoms it is positive evidence that he is not addicted to a narcotic drug.

No matter how stoical one may be, he cannot conceal a condition such as this and keep down the physical symptoms that arise upon the abrupt withdrawal of an opiate. If these symptoms do not make their appearance during the first forty-eight hours of this test, the physician may be satisfied that the patient is not a drug addictee.

The evidences of the use of narcotic drug when the use is carried to extremes are very marked. The symp-

toms occurring in those who use drugs in moderate quantities appear in an exaggerated degree in those who use larger quantities. The indifference and want of care of the person present a most marked contrast between one who uses large and one who uses small quantities of narcotics.

Very few persons, indeed, will keep their persons clean if they are addicted to the use of narcotics in anything like large quantities. This unkempt condition is so marked that one can readily pick these people out upon sight.

Some persons do, however, succeed in using opiates, even in large quantities, and in keeping that fact from becoming known. They have, by long and systematically cultivated habit, learned to keep themselves in practically a uniform condition under the effects of the opiate. This is looked upon as their normal state, and, as they are never seen in any other condition, one does not suspect the use of an opiate. But opium users who are thus consistent and methodical in their life are extremely rare. Many of them think that they are keeping their addiction concealed, but they deceive only themselves.

SYMPTOMS WHICH INDICATE THE USE OF OTHER DRUGS WITH AN OPIATE.

The combination of cocaine with morphine is a common form of addiction and persons who take such a combination of drugs manifest distinctly different traits of character from those who take opiates alone. Cocaine to some extent opposes the effects of morphine, and, instead of there being such periods of depression and despondency as occur in those who use morphine alone, the waking hours of those who use cocaine with their

morphine are spent in the condition of exaggerated stimulation.

The dose of the drug is taken very much more often than when morphine alone is used. In fact, there is a constant effort to balance the effects of the two drugs on the system. If a little more impression of the morphine is developed than suits the particular fancy of the addictee, he at once injects a little cocaine to counterbalance this unwholesome effect, and probably in doing so he gets a little more impression from the cocaine than is desired, and then more morphine is taken to overcome that.

One who is taking drugs in this combination can hardly do anything but attend to his own physical wants, injecting a little cocaine now and a little morphine a short time afterward, then a little cocaine to counterbalance that. Thus, he is engaged from early morning until late at night in trying to keep the effects of these two drugs exactly balanced in his system.

The period of drowsiness that occurs in those who use opium or morphine alone does not occur, but when a patient has dosed himself through the day and up to a late hour at night, and decided to discontinue his dosing and take sleep, he soon becomes drowsy and falls into a heavy slumber, which lasts from twelve to eighteen hours, extending probably well into the following day. Then, just as soon as he is awake, before he is able to arise from the bed and dress himself, a dose, and often from two to three doses, of his morphine-cocaine solution are taken.

The behavior of the cocaine habitué is very characteristic, especially in walking. He will not persist in doing any one thing long. If he starts out for a walk, he will travel in one direction probably half a block,

then abruptly turn to the right or left and go in a straight course again for a short distance, and then he will "tack" again in some other direction, going in a zigzag course, instead of walking straight along the street or road.

This zigzag, or "tacking," course of travel is very noticeable in one who is under the influence of cocaine. Such persons usually walk rapidly, as if in a great hurry. They are nervous and fidgety and excessively talkative. The appetite is so variable that they will, at times, eat enough at one meal for four or five, and then not take a mouthful of anything to eat for one, two, or three days.

A person addicted to a combination of atropine or hyoscine with morphine presents certain peculiarities not seen in any other form of addiction. Those who are addicted to these commonly combined drugs have a fidgety disposition that is very characteristic.

Almost constantly, during their waking hours, they are in motion, never being entirely still as much as one-tenth of a minute, unless they are asleep. This constant disposition to move is noticeable to some extent in the morphine-cocaine addiction, but it is much more marked in those who are addicted to morphine and atropine.

The use of this combination of drugs is usually begun by taking tablets containing $\frac{1}{4}$ grain of morphine and $\frac{1}{150}$ grain atropine. As the morphine is increased the atropine is increased proportionately, $\frac{1}{2}$ grain morphine carrying with it $\frac{1}{75}$ grain atropine, and so on, until by the time the individual is taking 6 grains of morphine per day he is getting with it $\frac{2}{150}$ grain of atropine; this quantity of atropine renders one extremely nervous and fidgety. Those addicted to morphine-atropine suffer greatly from insomnia.

Persons thus addicted suffer from extreme nausea if morphine is taken without the atropine, so that they find it very difficult to change from that combination to morphine alone.

SYMPTOMS WHICH INDICATE DEPRIVATION OF THE ACCUSTOMED DRUG AND THOSE WHICH MAY BE EXPECTED TO DEVELOP UNDER GRADUAL WITHDRAWAL.

The author does not approve of the use of the gradual-reduction method in treating narcotic addiction, yet this work would be incomplete without a description of the symptoms and conditions which develop under and following such a course of treatment.

That the author may not be charged with prejudice in recording the conditions which arise under the gradual withdrawal of opiates, he thinks it best to allow others to record these conditions. Dr. J. C. Wilson, in Pepper's "System of Medicine," vol. v, pp. 657, 658, and 659, says:—

"Opium habitués, differing as they do among themselves in the manifestation of the drug as long as it is freely taken, all alike develop characteristic symptoms upon its speedy or gradual withdrawal.

"The nervous system, whether it has been accustomed for months only or for years to the influence of opiates, is upon its withdrawal forthwith thrown into derangement of the most serious and widespread kind. In the course of a few hours after the last dose, the steadying influence of the drug disappears. General malaise is associated with progressive restlessness. The ability to perform the ordinary duties of life gives way to profound indifference. Precordial distress accompanied by cough is followed by insomnia, hallucinations, and sometimes by mania. The habitual pallor of the face is replaced by a deep flush or

cyanosis. The heart's action becomes excited or irregular, then feeble; the pulse, at first tense, becomes slow, thready, and irregular. Colliquative sweats appear; attacks of yawning and sneezing are followed by convulsive twitchings of the hands; speech becomes hesitating, drawling, and stuttering. These phenomena are associated with a sense of perfect prostration which obliges the patient to take to his bed. Pain in the back and limbs followed by neuralgia occurs. Complete anorexia with easily provoked or even causeless vomiting, and persistent nausea and diarrhea difficult to control, adds to the gravity of the condition.

"During the early days of abstinence the evidences of cardiac failure are marked. Enfeeblement of the first sound, irregularity of the heart action, and intermissions are common. Restlessness is continuous and very often intense and patients are with difficulty kept in bed; if left to themselves they move frantically about the room, moaning, bewailing their conditions, and begging the attendants for that which alone is capable of relieving their distress. This condition gradually subsides, giving way to one of profound exhaustion. The exhaustion, due to reaction of the nervous system, deprived of the stimulus of the drug, is on one hand favored by pre-existing derangements of the nutritive process, and on the other increased by the pain, wakefulness, diarrhea, and vomiting which accompany it. The appearance of the patient is now most pitiable; his countenance is blanched and pinched, the body occasionally drenched with sweat, the heart acting feebly, and the pulse irregular."

Of gradual reduction, Erlenmeyer says:—

"The patient after withdrawal is left in such a condition of physical weakness and mental dilapidation as to be the victim of intolerable suffering and unfit for enjoyment or application to work. He cannot sleep, he has no appetite, often vomits, feels too much used up to rise from bed. This condition continues for

a long time and grows worse from week to week. Various attempts at cure prove useless. Morphine is the only remedy."

It would seem that descriptions such as the above by writers of unquestioned authority would deter anyone from undertaking the treatment of an opium habitué by gradual reduction, yet this method has the almost universal endorsement of medical writers. Even our latest works, such as Osler's "Modern Medicine," Ander's "Practice," and other authors of the highest standing, endorse the gradual-reduction method of treatment as the accepted mode of procedure.

This plan of treatment seems to be based upon the idea that the narcotic impressions, that is, the narcotic in the system, constitutes the *sum total of the malady.*

They insist that the drug should be gradually withdrawn, and hold out the impression that when the last of the drug is withdrawn the patient will be cured; in fact, some of them insist that we can hold before the patient the most alluring prospect of complete freedom as soon as the last of the drug has been given up. They take no thought of or seem not to recognize the other pathological conditions present.

It is true that the narcotic drug is a toxic substance and its presence in the system would have a toxic and deranging effect, but the drug itself is present in so much smaller quantities than other poisons which it imprisons in the system that it is a comparatively minor factor in the production of the symptoms which develop upon the withdrawal of the drug.

The withdrawal of the drug without removing these other irritating poisons from the system leaves the patient to contend, single-handed and alone, with this accumulated toxic matter, and he is utterly unable to do so with success. When the narcotic impression is re-

duced to any considerable extent below that to which the patient is accustomed, the nervous system then begins to feel the irritating effects of the toxins of auto- and intestinal origin with which the system is saturated, and in response to this irritation the various manifestations of distress develop.

And, even if success is attained in withdrawing the last particle of drug, the patient's system is still left in an unwholesome condition. So long as any narcotic impression is made the excreting organs are retarded in their work and a residue of toxic matter accumulates each day. When the last of the drug is discontinued, the patient is left without its support or its restraining effects on the system, and the real battle begins.

Diarrhea of an exhausting character sets up and this often continues until the patient's bowel is so excoriated that something must be done for relief. Various remedies, astringents, colonic flushing, etc., may give some relief, but they do not quiet the nervous system or entirely overcome the distress. Under these conditions the appetite is absent and the patient, instead of building up, constantly loses weight. He becomes discouraged, if not entirely desperate.

In this wretched condition he will seek relief at any cost and will use any kind of narcotic or anodyne which will, to any degree, mitigate his suffering. Under the compulsion of such distressing conditions patients of this character will conceal drugs and bring them into the institution, or do anything in their power that will bring them relief, and such conduct has been held to be, or regarded, as a lack of candor and good faith on their part. It is at this point that most of them pass from under the care of the physician. Or, if they remain under his care it will often be found that they have

secretly secured something to take in this extreme emergency, and that entirely nullifies the efforts of the physician to free them from their addiction.

Any course of treatment which brings a human being into such a wretched state, and involves such an ordeal of suffering as does the reduction methods, cannot be too strongly condemned, and the author cannot but express surprise that writers of such note still continue to endorse such procedure.

SYMPTOMS WHICH ARISE UPON THE SUDDEN SUPPRESSION OF THE OPIATE.

Other writers who consider the habitual use of narcotic drugs a mere vice insist upon their immediate withdrawal, and they advise this without any regard for its consequences to the patient. The abrupt withdrawal of an opiate from persons addicted to its use without first preparing the patient's system for such withdrawal is not only dangerous to life, but it is barbarous.

This course is not now pursued in any reputable institution for the treatment of drug addiction, but it is often practised in our insane hospitals and jails. Persons who are addicted to narcotic drugs are arrested, thrown into a cell, without any provision whatever to supply them with the drug, and within twenty-four or forty-eight hours the victim is taken from the cell a corpse, having sunk into a complete collapse.

In fact, this end comes, often, within twelve hours after the arrest, because, in many instances, the poor wretch has been unable to secure his drug, and it was his conduct when suffering this deprivation that led to his arrest. He was already *in extremis* when arrested, and, being thrown into a cell, where he is helpless and unprotected, he soon sinks into collapse and death closes

the scene. There should be a rigid law enacted to require officials, when taking in charge persons of this type, to see that they are attended by a physician and supplied with the drugs to protect them from these extreme conditions.

That it may be seen that the views of the author are in entire accord with other writers upon the subject, the following quotations are given:—

"This method of the abrupt withdrawal is attended in all cases by indescribable suffering, and, in many, by serious results. Among the last, collapse and delirium tremens demand special consideration. The collapse which occurs in a certain proportion of cases requires thorough and energetic treatment. Failure of the circulation may, notwithstanding every effort to control it, reach such a degree as to jeopardize the patient's life." (Pepper's "System of Medicine," vol. v, pp. 673, 675, and 676.)

Of the sudden withdrawal, Erlenmeyer says:—

"The physician-in-chief, or his subordinate, must be with the patient night and day for the first few days of treatment, when the struggle will be greatest. There will be a collapse of the vital forces and it may be a matter of life and death with the patient, and, in this hour of danger, ripe experience, presence of mind, and readiness in emergencies are necessary in the physician and attendants.

"They must pitilessly resist the importunities of the patient for morphine, while at the same time they must not lose their compassion and sympathy for the poor sufferer. There will be numerous symptoms constantly occurring, such as vomiting, diarrhea, and restlessness, etc., which will demand the attention and keep the medical attendant and nurse busy; there will, for a time, in fact, be no rest for anybody.

"The responsibility of keeping the patient from inflicting injury on himself is no light strain on the nerves of the physician,

who must exercise untiring vigilance, and no one can endure this strain more than twelve hours without respite and rest."

(How long can the patient be expected to endure this? [Author.])

"The sudden withdrawal entails horrible suffering and is utterly inexcusable." (Merrell's "Therapeutics.") "The apartment occupied by the patient must be so arranged as to guard against the attempts of suicide." (Pepper's "System of Medicine.")

It is evident that the cure of a drug addictee could not be expected from so barbarous a process. It is strange that anyone could lead himself to believe that subjecting any human being to such an ordeal of suffering as is involved in the abrupt withdrawal of opiates, without preparatory and protecting treatment, could result in any benefit to the patient.

Coercion of this kind has done much to prejudice the cause of the drug users. Under such extreme conditions they have been forced to do things to protect themselves which have been interpreted as perversions of character, and this has militated against their receiving that degree of consideration to which their condition justly entitles them.

However, if the proper course of preparatory treatment is carried out, opiates can be withdrawn from those addicted to their use without danger to life and with much less suffering than is usually encountered by the methods heretofore in vogue.

As has been pointed out in the chapter on Pathology, the essential pathology of this condition is intoxication of drug, intestinal, and auto- origin. Most of the symptoms incident to the withdrawal of drugs are due to these toxins. In fact, all of the dangerous symptoms are caused by them and most of the painful symptoms are due to them also.

If the system be thoroughly cleansed from toxic matter of internal origin, morphine or other narcotic drugs can be at once withdrawn from an habitué without danger to life and the suffering incident to such a withdrawal will be reduced so much compared to what it would have been without such a course of preparatory treatment that the condition of the patient will not bear any resemblance whatever to the condition of one who has not had this cleansing treatment preceding the withdrawal.

The engorged condition of the portal system is the chief factor in bringing about a labored and deficient heart action, and this deficient heart action is an essential factor upon which collapse, the principal dangerous symptom, depends. If this engorged condition is remedied, then the other conditions developing out of it do not occur and the patient can weather the remainder of the storm without great danger. However, he would suffer intensely, but that suffering would have a natural limit of about three days. After that time, the secondary effects of the opiate having subsided, the reactionary symptoms disappear and the patient reaches a condition of fair comfort.

At least six of the most troublesome and dangerous complicating symptoms incident to the abrupt withdrawal of opiates have their origin in a perverted function, viz.: deficient excretion. These are intestinal colic, nausea, vomiting, diarrhea, labored and deficient heart action, and collapse.

By thorough elimination these may be prevented altogether and a number of the other symptoms of nervous and mental origin greatly modified, if not entirely obviated.

But many of the nervous and mental symptoms incident to such withdrawal will develop and continue for

from two to three days. The patient would suffer intensely during that time and this suffering would seriously impair his nervous system, weaken him physically, and lessen his powers of resistance, but the danger to life, so prominent from the withdrawal without elimination, would be avoided.

This suffering, severe as it would be, can be obviated by a rational course of treatment and these distressing days can be passed in comfort; the method of doing this will be sufficiently considered under the head of Treatment.

As another chapter in this book will be devoted to the consideration of the gradual reduction method of treatment, the symptoms developing during such treatment, and the condition of the patient during the period of convalescence, together with the effects of such treatment on the mind of the patient, and upon his future usefulness, it is not thought necessary to consider that method of treatment farther at this place.

As to the symptoms during convalescence which follow the sudden withdrawal as ordinarily practised, if the patient survives so that any symptoms at all may develop, suffice it to say the patient's system is left in an extremely toxic and disordered condition, and any of the physical ailments which arise from toxic conditions may be expected to develop during the period of convalescence. But even with the most perfectly balanced and carefully directed course of treatment, certain symptoms arise during the period of convalescence which seem to be unavoidable.

Among the first of these to appear is a general hyperesthesia. The nervous system of the patient being long accustomed to work under the restraint of this anesthetizing drug, when this restraint is withdrawn, wakes up

to such a degree of activity that a general hyperesthesia is present.

In other words, the condition of anesthesia which exists and becomes a chronic state under the influence of the continued use of opiates is succeeded by a hyperesthesia equally marked and which continues for a considerable length of time after the complete withdrawal of the drug.

This hyperesthesia not only manifests itself in undue sensitiveness of the sensory nerves, but also in many other parts of the nervous system. Even in the conversation of the patients there is an element of excitability, and the slightest opposition or mental stimulation brings on a mental excitement that is altogether abnormal.

It is evident that the brain and spinal centers, being released from the restraining effects of the opiate, are too sensitive and respond abnormally to any stimulation, either physical or psychic, and this condition of hypersensitiveness or hyperesthesia continues in some cases for several months. In others a few weeks serve to terminate it.

Another symptom which is unavoidable is a slight rise of temperature, especially during the afternoon of each day. The author has taken much pains to determine the cause of that symptom, but is uncertain yet as to which of three or four factors is most potent in its causation. This fever appears in practically every case and continues sometimes as long as four weeks after the entire withdrawal of the drug.

In the opinion of the author any one of several conditions that are evidently present might account for the fever. We have just seen that the condition of the nervous system is one of general hyperesthesia. In this

condition it is likely that the heat-centers are so disturbed that there is a loss of balance between the rate of heat production and heat radiation, thus allowing an expression of hyperpyrexia.

Then, again, the nervous system, in fact the whole organism, has become accustomed to doing its work under the restraint of the opiate. This restraint being withdrawn, it is likely that all the vital functions would be carried on at a more active rate than normal, the nerve-centers being hypersensitive. This would doubtless lead to the greater than normal production of heat.

Again, the system is usually anemic and there is a great demand for nourishment. This being taken, there is increased activity of the digestive process. The increased oxidation incident to this increased metabolism involves increased heat production. If the nerve-centers are disturbed so that the radiation of heat is imperfectly adjusted to heat production, it is evident that there would be hyperpyrexia from more active metabolism.

But more likely than either of these is that there remains a residue of toxic matter in the system—in the ultimate cell—which the most persistent and thorough elimination cannot remove at once, and that the fever is due to the effects of this remnant of toxic matter upon the hypersensitive nervous system.

While the bowel may have been thoroughly emptied and the kidneys and skin made to do their full duty, or even more, it would be practically impossible to perfectly cleanse the system of such an accumulation of toxic matter in a few days, or even a week or more time. Therefore, it is probable that there would remain stored away in the tissues in the very structure of the cells a residue of toxic matter, and that this would act as an exciting cause of the fever.

The nerve-centers, being hypersensitive, would respond with undue activity to this toxic matter.

Then, again, with this hypersensitive state of the nerve-centers the slightest absorption of toxin from the intestines would result in an acute intestinal toxemia which would be attended by some fever, and this doubtless is its source in some cases.

But, whatever may be the correct explanation of its cause, it is present and when left uncontrolled greatly increases the discomfort of the patient during convalescence.

The more perfectly the system has been cleansed of toxic matter, the less fever will follow the withdrawal of the drug and the less pain there will be during the period of convalescence. Therefore, the author is inclined to be satisfied with the idea that this fever is of toxic origin.

The height of the temperature is usually about $\frac{2}{5}°$ in the morning, running to $\frac{4}{5}°$, $\frac{5}{5}°$, or probably to $1\frac{1}{5}°$ in the late afternoon. This gradually subsides, disappearing in some cases as early as the second week, while in others it continues to the fourth or fifth week. The duration is influenced to a considerable extent by the dietary habits of the patient.

In the afternoon, when the temperature rise amounts to as much as $\frac{3}{5}°$ or $\frac{4}{5}°$, there is more or less discomfort, aching of the limbs, etc. Antipyretics do not make much impression on this temperature, that is, the coal-tar derivatives do not. Aspirin, on the other hand, does reduce the temperature and give relief from the painful symptoms arising from it. Another useful agent is pilocarpine. This brings about a moist state of the skin accompanied by remission of fever and gives much relief through a general relaxation of the entire system.

The appetite after the withdrawal of opiates is usually ravenous and if the patient be left to follow his own inclinations he will eat more than he is able to digest, and this will often be followed by digestive disturbances of the most marked character. It could not be expected that such disturbances would not develop.

The stomach is no stronger than any other part of the patient's body, yet it is called upon to do a full day's work each day. If the patient were called upon on these days to do a day's work of any kind, he would be totally unequal to it. Therefore, it would be unreasonable to expect the stomach to do full work in such a debilitated condition.

If the patient is left to gratify his appetite at will, in from one to two weeks he will overtax the digestive organs to such a degree that acute digestive disturbances will develop, and these are attended by much discomfort. Unless the patient is warned against this and made to understand the cause of his suffering, as well as the means of relieving it, this distress will cause his mind to revert to the opiate and probably lead him to take something of that kind for relief of this acute ailment.

This is one of the reasons why a patient should remain in an institution and under the supervision of his physician for a considerable time after being taken off of the drug. He must be taught to live free from excess of every kind, but especially should excesses in eating and drinking be avoided, since it is only by this course that relapse can be avoided.

With the error as to diet in general that is prevalent throughout the world, the physician will be called upon to teach his patients many things along these lines and to supplant error with real physiological truths. This is no small undertaking, but it is just as essential to suc-

cess in an effort to restore the drug slave to complete self-mastery as the therapeutic measures were in the early treatment of the case.

Drug patients eat very heartily and they often take on weight at a very rapid rate. This increase of weight is largely due to the accumulation of fat rather than muscle, and this, at times, becomes an encumbrance to them. This new tissue should be developed into stout muscular fiber by a proper course of physical training and outdoor exercise.

CHAPTER III.

TREATMENT.

THE treatment of narcotic drug addiction from the earliest mention of this condition in medical literature seems to have been undertaken under the assumption, or belief, that the habitual use of narcotics was a mere vice, an indulgence, and that all that was involved in the treatment was to secure the renunciation of that vice, the discontinuance of the use of the drug.

As it was found extremely difficult to secure the breaking away from the habit at once, it was thought that, since it had had a progressive and slow growth, the natural and most successful way to bring it to an end was to gradually reduce the quantity of the drug taken until it was entirely discontinued.

Many ingenious schemes for carrying out this gradual reduction method of treatment were devised. This method of treatment has had, and still has, the endorsement of leading medical writers; but it is as unreasonable and unscientific as it is unsuccessful.

It is based on a total misconception of the nature of the condition to be treated, and, just as reasoning from false premises leads to false conclusions, so the treating of a disease with a false idea of its pathology gives faulty results. In this instance the results have been even worse than faulty. It is not believed that as many as two persons out of each hundred treated by gradual reduction have been cured.

The writer would not condemn this method so strongly if failure to cure was all the effect it had had on the ninety-eight out of each hundred who submitted

to it without being cured. But, mere failure to secure a cure was not all; the impressions made on their minds, the lasting damage to their mentality, were such as to reduce, very greatly, their chances of being finally cured.

In the chapter upon Reasons for Past Failures in the Treatment of Morphinism, the author will give his views at greater length upon the gradual reduction method of treatment.

Eleven years ago the author published his first paper on "Narcotic Drug Addiction." In that paper twenty-one propositions as to the pathology and treatment of narcotic addictions were advanced, none of which had, prior to that time, appeared in medical literature. As these propositions have stood the test of time and an extensive clinical experience since that time has only led to their enlargement and amplification, it is, he trusts, with a pardonable pride that they are here restated, notwithstanding such restatement involves a practical reproduction of matter used elsewhere. They are, in substance, as follows:—

1. The essential pathology of narcotic drug addiction is a toxemia, the toxins being of drug, auto-, and intestinal origin.

2. At least six of the most troublesome and dangerous complicating symptoms have their origin in a perverted function, viz.: deficient excretion. These are intestinal colic, nausea, vomiting, labored and deficient heart action, and collapse. By thorough elimination these may be prevented altogether, and a number of the other symptoms of nervous and mental origin greatly modified, if not avoided.

3. The motor function of the bowel is the function most impaired by the effects of opiates.

4. Purgatives, secretory stimulants, as ordinarily given, which excite intestinal motion by reflex action,

do not sufficiently restore that function to bring about effective emptying of the intestinal canal of a drug user.

5. In order to empty the intestinal canal of a drug user direct, positive stimulation of the motor centers is essential, strychnine being the most suitable agent for this purpose.

6. Since in narcotic drug users all the nerve-centers are profoundly impressed with the narcotic, resulting in extreme lethargy of intestinal motion, larger than ordinary medicinal doses of strychnine are required to overcome this lethargic state and excite efficient peristalsis.

7. If the motor activity of the bowel be efficiently induced and maintained by direct stimulation of the motor centers with strychnine, no larger quantity of the glandular stimulants is required to promptly and fully empty the intestines of the drug user than in those not using the drug.

8. If free peristaltic action is excited while the system is still under the sedative influence of morphine, little, if any, distress occurs and the intestinal canal can be thoroughly and promptly emptied.

9. Strychnine, if given in sufficient doses, will excite active peristalsis, notwithstanding the restraining effects of the opium.

10. Unless efficient provisions for the prompt and full excitation of the motor function of the bowel be made, any secretory stimulant given will merely excite excessive secretion in the upper part of the intestinal canal, accompanied by griping, nausea, vomiting, and other distress, but will be unable to empty the canal, reflex action alone not being sufficient to induce peristalsis when the nerve-centers are so benumbed by narcotics.

11. Deficient heart action leading to collapse in these cases is mainly due to portal engorgement.

12. When the intestinal canal has been thoroughly cleansed and portal engorgement overcome, morphine or other narcotics can be at once withdrawn from an habitué without danger to life and without the occurrence of shock, diarrhea, colic, vomiting, or the slightest appearance of collapse.

13. A general hyperesthesia follows the withdrawal of opiates from an habitué, this being the natural reaction from the state of chronic anesthesia to which the drug user has been accustomed. This extends to all of the functions of the body, mental as well as physical.

14. The severe suffering incident to the abrupt withdrawal of opiates, after thorough elimination has been carried out, has a natural limit of a few days' time. This suffering, severe as it would otherwise be, can be obviated and these days passed in comfort by the discreet administration of scopolamine.

15. The therapeutic use of scopolamine, for the time it is required in these cases, does not, in any way, perpetuate the desire or necessity for the use of an opiate. While it relieves pain, induces sleep, and overcomes those distressing symptoms of nervous origin that follow the withdrawal of morphine, its action so opposes the effects of the opiate that, instead of perpetuating the effects of the morphine, it stimulates the centers which have been benumbed by that drug and shortens the time during which its secondary effects would be manifested.

16. When the patient's system has been thoroughly cleansed from toxic matter, the drug withdrawn, and the patient prevented from suffering with scopolamine for from two to three days, no craving or desire for the drug remains, abstinence symptoms, such as ordinarily

follow the withdrawal of opiates, are obviated, and the patient is brought to a condition in which he can pass his time in comfort, eat heartily, sleep from four to six hours out of each twenty-four, and this insures safe and rapid convalescence.

17. The dose of scopolamine cannot be definitely fixed. The dose varies greatly in different individuals, the range being from $\frac{1}{300}$ to $\frac{1}{50}$ grain at intervals of from thirty minutes to six hours. At first the smaller doses should be given and repeated at short intervals until sleep is induced, or at least until the patient is free from all pain. After this the dose should be of such size and be given at such intervals as are necessary to overcome all painful symptoms and to keep the patient comfortable. The dose in one case is no index to what will be required in the next; only by a physician experienced in such matters being present and observing the effects of each dose can the proper dose be ascertained and the patient be kept in a comfortable condition.

18. The patient should not be allowed to suffer. Scopolamine, in remedial doses, does not materially affect the vital functions or leave after-effects on either the mind or body of the patient; therefore, it should be given until its full physiological effects are manifested, if necessary. To allow the patient to suffer during the treatment impairs his nervous system, lengthens the time during which treatment will be necessary, and materially increases the danger of the relapse.

19. The period of convalescence during which the patient must be kept under supervision is also considerably reduced, but varies greatly in different individuals. The absence of that train of nervous symptoms, the ability to sleep naturally, to eat heartily, and the improved digestion and assimilation by which the patient

rapidly gains in flesh and strength lessen the liability to relapse almost as greatly as this curative plan of treatment lessens the dangers and sufferings while under treatment.

20. The after-treatment in these cases does not consist in the administration of drugs, and no drugs should be given unless specifically indicated. There is certainly no place for the administration of alcohol or strychnine in the after-treatment.

The reduction or suspension of inhibitory control by the effects of alcohol permits an extravagant and premature expenditure of energy, and this is followed by marked depression. This depression is felt to an exaggerated degree by one who has recently been taken off of a narcotic drug and such a one will not long tolerate it, but will seek to blunt their sensibilities to it by taking more alcohol. This, in turn, lessens inhibitory control, and energy is again prematurely expended, and this is followed by increased depression.

Depression from the secondary effects of alcohol calls loudly for a dose of the narcotic to which such person had been accustomed and if that is taken the person is well on the road to relapse. Alcohol in all forms should be interdicted during convalescence and forever afterward.

Strychnine keeps up too active peristalsis and inclines the bowel to empty itself too often. This interferes with digestion and assimilation and causes diarrhea by the passage of incompletely digested food through the bowels.

21. Unloading the intestinal canal and relieving portal congestion lessen the strain under which the heart has been working more than enough to compensate for the loss of the stimulus it derived from the effects of

morphine, and, instead of the heart's action being weak or irregular, the character of the pulse is decidedly improved. It has greater volume, is softer, more compressible, and is, in every respect, of better quality than when propelling the blood against the obstruction of an engorged portal system, even though it was supported by morphine. However, should the heart action be weak, or for any reason need support, sparteine sulphate, 1 to 2 grains hypodermically, every four to six hours will give it more uniform and efficient support than morphine or any other known drug.

In endeavoring to formulate a line of treatment based upon the views of pathology, etc., hereinbefore mentioned, the mind would naturally turn to the thought: "Is there not an antidote, an antitoxin, that will neutralize this toxic matter in the system?" Since we have a toxemia to treat, to destroy or neutralize those toxins with an antibody would be the most prompt, and, doubtless, the most successful, treatment. But when the complex character of the toxemia is considered we could not hope to secure an antitoxin capable of destroying these toxins in the system.

The toxin resulting from the faulty action of the liver and kidney, from the intestinal glands, in fact, from each organ, would necessarily differ. An antitoxin suitable to neutralize the poisons arising from faulty action of one of these organs would not likely neutralize those made from another organ. Therefore, instead of endeavoring to neutralize or antidote the toxins in the system, rational medicine demands that the excretory functions be unlocked, and that this accumulated toxic matter be removed from the system.

But rational medicine also demands that this be done in the most conservative manner possible. Narcotic

drug users are anemic and should not be depleted unduly; therefore, purgatives given to them should be compounded so as to act in the most conservative manner.

By uniform and proportionate stimulation of all of the functions concerned in the evacuation of waste, the system can be thoroughly cleansed of toxic matter without exhausting the patient's strength or otherwise taxing his vital energy.

Let us consider the steps necessary and the agents most suitable to be used in this undertaking. First, a tub bath followed by a vapor bath will aid materially in throwing off the poisons. This should be regulated according to the patient's strength. Free drinking of water, to flush the kidneys and carry off a larger per cent. of urea, etc., will aid materially.

But these are each of minor importance. When we consider that the bile and bowel discharges are nine times as toxic as the urine, and that the urine is fifty times as toxic as the perspiration (Bouchard), we can see that even a small discharge from the bowel contains many times more toxic matter than could be thrown off by the skin during a vapor bath. Therefore, it is to the bowel we must look for the discharge of most of this poisonous matter.

Since we have seen that the motor function of the bowel is almost completely suspended by the effects of the opiates, it is evident that in preparing a purgative course we should arrange to overcome the semiparalyzed condition of this essential function.

Any purgative compound which does not conform to this standard will only distress the patient, instead of bringing material relief.

The author has found the following formula to be a physiologically balanced purgative compound and one

that has given excellent results in narcotic cases in his hands:—

℞ Calomel,
Powdered extract of cascara .....āā gr. x.
Ipecac ..... gr. j.
Strychnine nitrate ..... gr. ¼.
Atropine sulphate ..... gr. 1/50.

M. and make 4 capsules. Sig.: One every two hours until 4 are taken, preferably at 4, 6, 8, and 10 P.M., and only after having abstained from dinner and supper on the day on which they are taken.

Thorough elimination of toxic matter from the system is the primary and most essential step in the treatment of morphinism.

The principal obstacle in securing action of purgatives in drug addictees arises from the suspension of peristalsis by the primary effects of the opiates. During a period varying from four to eight hours from the time of taking the dose of morphine intestinal motion is almost, if not entirely, absent; but as the early effects of the dose subsides, peristalsis is again gradually re-established.

Drug users, as a rule, take their drug only during the day, or from the time of rising in the morning until bedtime—say, from 8 A.M. until 10 P.M. During these hours the system is kept constantly under the primary effects of the opiate, and intestinal motion is very much restricted, but between 10 P.M. and 8 A.M. the effects of the day's dosing wear away and peristalsis becomes fairly active, and it is during the latter part of this period that the excretory organs do the principal part of their work. In order to secure efficient action of purgatives advantage must be taken of this state of affairs.

The remedies must also be so compounded, and be given at such times, as to have the acme of their effects, both as motor and secretory stimulants, occur during the latter part of this period, when the system is least under the restraining influence of the opiate.

To do this, begin with the capsules made by the formula above given, at, say, 4 P.M., and let the last dose be given about 10 P.M. Let the patient be given the opiate in his usual doses up to 8 or 10 P.M., but none must be given from that time until after the bowel has been thoroughly emptied on the following morning.

Nothing in the way of nourishment should be allowed to go into the patient's stomach during a period beginning as much as six hours before the time of giving the first purgative capsule and ending after the purgation is completed. Then the patient may be given nourishment.

If the patient is of average size and weight and no opiate is given after the time of giving the last purgative capsule, the strychnine and atropine in these capsules will excite a fair degree of peristalsis, notwithstanding the restraining effects of the opiates, and this will enable the glandular stimulants given with them to induce free evacuation from the bowel in from eight to ten hours after the time of giving the last purgative capsule, thus securing bowel movement before the time for the usual morning dose of morphine.

But more certainly to secure this result, six or eight hours from the time of giving the last purgative capsule give $\frac{1}{20}$ grain of strychnine, hypodermically, and follow this half an hour later by 2 ounces of castor oil or a bottle of citrate of magnesia. Both the strychnine and the oil or saline should be repeated at intervals of two hours until the intestinal canal has been thoroughly emptied.

It is essential that no morphine or other narcotic be given during this time.

If the bowel begins to act before the time for taking the usual morning dose of morphine the patient will experience little, if any, discomfort; but on the contrary, the relief afforded by the active elimination will be such as to enable the individual to go for several hours beyond the time for the morning dose of narcotic without feeling the need of it, and this should be done, thus allowing as much time for elimination as possible.

When the patient has gone as long as he can without discomfort and begins to feel the need of the drug he has been taking, it should be given him, but in reduced doses. It will be found that after the bowel has been thoroughly emptied and the patient has gone without his drug several hours beyond the usual time of taking it not more than half or two-thirds the usual dose will be required to meet the demands of the system.

This reduced quantity should be given at the same intervals at which the individual had been taking doses of morphine before beginning the treatment. After the purgation has been complete the patient may be allowed a liberal diet until within six or eight hours of the time of giving the next course of purgative.

Forty-eight hours from the time of the first purgative course another, consisting of the same ingredients, should be begun and given as the first. This course may be less or more active than the first, according to the effects obtained from the first, but no one of the several ingredients should be left out. Each of these does an important part of the work which the other cannot do so perfectly without its aid.

After the first purgative course has acted freely the patient should be given his morphine in as small doses

as will keep him comfortable, up to the time of his evening or bedtime dose on this, the second, day for giving the purgative courses; but no morphine or other opiates should be given after the time of taking the last purgative capsule of the second course.

Six or eight hours from the time of giving the last purgative capsule of the second course, strychnine and oil or saline should be given as before and repeated, if necessary, until free bowel movement has been obtained. During this time the patient should be given a bath and put to bed.

The action of this course of purgative will carry into and out of the intestinal canal a residue of extremely toxic matter, and the patient will experience such relief from it as to enable him to go even longer beyond the time for his accustomed dose than he did after the first course, especially if he remains in bed, which he should do.

In the course of from six to eight hours after the time for his morning dose, however, he will begin to feel uncomfortable and require something for relief; then instead of giving the opiate as before, scopolamine in $\frac{1}{200}$-grain dose should be given, hypodermically, and the same dose repeated in thirty minutes.

An average patient will usually fall asleep in half an hour from the time of giving the second dose of scopolamine; but if not, and if he is at all uncomfortable, the third dose of the same size may be given. If the patient is not uncomfortable, let him go until the lapse of an hour from the time of giving the second dose. If at the end of that time he has not fallen asleep a third dose should be given.

This dose may be of the same size as the other two, or it may be increased to double that size, depending upon

the degree of impression made by the preceding doses. If the patient has no unusual tolerance for the drug, these doses will bring him under the influence of the remedy to such a degree as to either induce sleep or to establish a mild belladonna intoxication, in either of which conditions he is free from suffering.

If he does go to sleep he should be allowed to sleep until he awakens, even if that be six or eight hours; but when he does wake, no matter how comfortable he may be, an additional dose of scopolamine should be given. Usually $\frac{1}{200}$ grain is sufficient, but that must be regulated by the susceptibility of the patient. These doses must be repeated at such intervals as may be required to keep up a mild belladonna intoxication and to keep the patient free from pain.

He may sleep more, or he may not, but that does not matter so long as he is kept in a comfortable condition. He should be impressed to this degree with the scopolamine for a period of thirty-six to forty-eight hours from the time of beginning this remedy, and then all the narcotic medication should be discontinued.

During the time the patient is kept under the influence of scopolamine it is usually well to give 20 grains of sodium hyposulphite every two hours, which should be continued for twenty-four or more hours after the scopolamine period has passed. The small, frequently repeated doses of hyposulphite supplement the effect of the calomel purge, and after they have been kept up for twenty-four to thirty-six hours the patient will begin to have small, bilious stools unattended by colic, griping, or other distress which will more fully cleanse the system of toxic matter and prepare the patient for a rapid and successful convalescence.

This period is reached by the end of the fifth or sixth day from the beginning of treatment, after which no

medication is indicated so far as the addiction itself is concerned. If elimination has been thoroughly carried out, the patient will have no desire for his drug, nor will he suffer because of abstinence.

It is true he will feel weak and miss the support of the artificial stimulant to which he has been accustomed, but the unbearable nervousness, hot flashes, aching of the limbs, labored heart action, sweating, diarrhea, restlessness, and insomnia so prominent under most other plans of treatment will be absent and the patient will be able to lie quietly in bed and pass his time in comfort and not only enjoy taking nourishment, but the average patient will digest and assimilate a liberal quantity of it.

If the heart action is at all deficient, either during or after treatment, sparteine sulphate in doses of 2 grains at intervals of four to six hours should be given, as indicated; but it is rarely necessary to use anything for this purpose. The relief afforded the heart by cleansing the system of toxic matter and unloading the portal system is more than enough to compensate for any support it had been receiving from the opiate, and the circulation is usually better than it was under the opiate.

The period of convalescence of from one to two months should be spent under the direct supervision of his medical adviser and preferably in an institution devoted entirely to the treatment of this class of patients.

It is a mistake to undertake the treatment of such patients at their homes or in a general hospital. Such environment does not afford the physician that degree of personal supervision of the case and control of the surroundings necessary for the welfare and protection of the patient. Neither does it afford the accessories which may be used to advantage.

In a properly equipped institution, hydropathy, electricity, massage, and other such rational means are at

hand and can be employed to meet any slight complication from which the patient may suffer, and thereby avoid the administration of medicine, and more perfectly wean him from dependence on drugs.

The active therapeutic measures required in the treatment of these cases are completed in a few days' time, but the patient must not be considered cured simply because he has been taken off the drug and brought to a condition in which he no longer wants or requires it.

Discreet supervision during the period of convalescence is as essential to the permanency of cure as the therapeutic measures were to its beginning. The patient must be given every aid possible in the effort to regain his self-control, and must not be thrown on his own resources until he has fully reached that point. From two to six months can be well spent in securing that result by anyone who is seeking freedom from drug slavery.

No two cases of morphinism are exactly alike and no routine treatment can be devised to meet the requirements in every case. However, only two of the remedies thus far considered will, ordinarily, need to be varied in quantity or time of administration. These are the strychnine and scopolamine.

The more opiate that is being used, the more strychnine will be required to overcome its paralyzing effect on the motor function of the bowel. The age, weight, and physique of the patient must also be considered in determining the quantity of strychnine required. The difference in the susceptibility of the different persons to strychnine can be estimated with a fair degree of accuracy. The tall, loosely built person with flabby, anemic tissues requires much more strychnine to bring his muscular system to a fair degree of tone than does the

small, compactly built, whose tissues are not to such a degree atonic.

Unless strychnine be given in these cases in larger-than-ordinary medicinal doses, satisfactory results cannot be expected. It must be remembered that the entire nervous system is profoundly blunted with the sedative impression of the opiate. This renders the nerve-centers very unresponsive, and at the same time renders the peripheral nerves, on which impressions of a reflex nature depend, extremely insensitive to any peripheral irritation.

In this condition, if we are to establish a fair degree of motility of the intestinal canal, we must administer strychnine in such quantities as not only to overcome the paralyzing effects of the narcotic on the nerve-centers, but, in addition, sufficient to stimulate efficient motion. From two to three times as much strychnine is required to do this in a patient under a narcotic as one who is in a normal state.

This effect can be produced in the system without the slightest approach of danger; in fact, until the motor centers are thoroughly aroused to activity there is not the slightest danger of an overeffect of strychnine. One grain of strychnine is the smallest dose which is known to have produced a death in an adult, and this was in a normal adult, and not one under the influence of an opiate. Had this patient, or any patient, of that character been profoundly narcotized, doubtless this dose could have been taken with impunity. However, it is not necessary to push strychnine to such a degree as to be at all dangerous, or to cause the patient the least discomfort.

The primary effects of strychnine are exerted on the centers which govern involuntary motion. Therefore,

muscular fibers of the unstriated type, such as are found in the walls of the intestines, may be thoroughly stimulated to active motility before the centers governing voluntary motion are materially affected. In other words, strychnine expends its force, first, through the sympathetic system upon the functions of organic life. Therefore, these can be excited to full activity before the muscles of a voluntary type are affected so as to develop spasmodic action, upon which danger from strychnine depends.

In studying this question, in an effort to arrive at the extent to which strychnine should be given in order to secure the best results, the author, in many instances, gave ⅛ grain of strychnine every two hours until four such doses were given. These, of course, were persons who were profoundly under the influence of a narcotic drug, but these doses, even as excessive as they may seem, did not produce unpleasant symptoms or cause perceptible contraction of a single voluntary muscle or tendon.

In one case, a male patient weighing about 180 pounds who had lost 40 pounds in weight and was about six feet tall, and whose muscular tissues were flabby and relaxed, ¼ grain of strychnine was given every two hours until four such doses were given, making 1 grain of strychnine given in the eight hours. Not the slightest discomfort was produced by these doses. This patient was taking 20 grains of morphine per day hypodermically, and, in order to excite anything like a fair degree of intestinal motion, this quantity of strychnine was required.

These doses of strychnine were given combined with the purgative, calomel, cascara, etc., as above outlined. This purgative having not acted in eight hours from the

time the last potion of it was given, $\frac{1}{10}$ grain of strychnine was given hypodermically, followed, in half an hour, by 3 ounces of castor oil. An hour and a half after this the patient's bowel began to act and he had free evacuations; in fact, enormous evacuations, but these were unattended by any distress whatever.

The patient was not nauseated in the slightest degree; there was no colic or other distress; in fact, every function concerned in the evacuation of waste had, by this physiologically balanced purgative course, been stimulated to a degree sufficient to act in harmony and there was no more distress from such action than if the bowel had been acting normally.

Narcotic drug users are, ordinarily, very unpleasantly affected by purgatives. As a rule, physicians in preparing a purgative compound give secretory stimulants and depend upon these to excite the other function essential to bowel movements, that of intestinal motion. While they do this, they do it so indirectly and so imperfectly that before the entire bowel is thrown into motion, so as to make evacuation at all possible, the secretion induced by those agents has overfilled the upper segments of the intestinal canal.

This overdistention of the upper segments of the intestine causes griping, nausea, vomiting, and other distress. Direct stimulation of the motor centers with strychnine induces active peristalsis throughout the entire length of the intestinal tube and this free motility prevents undue accumulation in the upper part of the intestinal canal; in fact, as the secretions induced by the secretory stimulants are poured out, this efficient intestinal motion carries these secretions downward gradually, but as rapidly as they are formed, thus preventing the overfilling of the intestine at any point.

The overfilling being avoided, there is nothing to cause the disagreeable symptoms which are so common when a secretory stimulant alone is given.

During the early years of the author's work, in the treatment of drug addiction, he endeavored, by advice through the mails, to assist in the treatment of many cases of drug addiction. This was undertaken in such cases as a member of a physician's family, or of some invalid who could not be sent to an institution for treatment.

It was his earnest desire to help all such persons and to give as efficient aid in the matter as possible. He has written hundreds of letters of instructions to physicians, each based upon some particular case. He has found no difficulty, as a rule, in having any part of his instructions carried out, except in the administration of a sufficient quantity of strychnine to be effective in these cases.

The fact that strychnine is a toxic drug, and that the dose has heretofore been so much underestimated, has made almost all physicians hesitate to give the quantity required in these cases. He found the physician would give the prescription for the purgative in every detail as written, except that he would cut down the quantity of strychnine.

This reduced quantity being insufficient to establish active peristalsis, the action of the purgative was disappointing. More or less vomiting and other distress preceded or attended the action of the purgative, and before free evacuation of the bowel could be obtained the storm of distress was so great that the physician was forced to give an opiate to allay it.

When this was given all hope of further action from that purgative course was gone. Thus, the most essential step in the treatment, the thorough elimination of

waste, having failed, when an attempt was made to carry out other steps in the treatment the condition was so complicated by the toxic matter remaining in the system that satisfactory results could not be obtained.

Failure to give strychnine in sufficient quantities to efficiently provide for the intestinal motion having defeated the primary and most essential step in the treatment, that of securing free evacuation of the waste from the bowel, all the symptoms attendant upon the withdrawal of the drug were aggravated. The remainder of the treatment, if carried out at all, was done with the greatest difficulty and the results were unsatisfactory.

Finding such extreme difficulty in getting this essential part of the treatment faithfully carried out, he has for several years declined to assist in the treatment of any cases not under his personal supervision. He found that he was doing more harm than good and was bringing a good treatment into disrepute, when, had his specific directions been followed, the results would have been otherwise.

In order to make this matter more clear, if possible, he might compare the motor centers to a man asleep in a burning building. If a man was profoundly asleep, and the building was burning, one who was seeking to arouse him would hardly go to the door and tap gently, and expect to arouse him from profound sleep by the gentle and lady-like use of force—no; he would not tap gently, but vigorously; he would knock, and yell, and use the most vigorous means to arouse him from his slumber and bring him to consciousness, that his life might be saved.

Now, in narcotic cases the entire nervous system, the nerve-centers which preside over motion and secretion, is as profoundly lethargic as was this sleeping man. Does it not seem out of all reason to administer to such

a patient only the quantity of motor stimulants that would be required if the centers were in normal condition? There would be just as much reason to depend upon the lady-like tapping on the sleeping man's door to arouse him from his slumbers as there would be to expect the ordinary medicinal doses of strychnine to arouse these semiparalyzed centers to activity and excite an efficient peristalsis.

Unless a physician has the courage and the therapeutic skill to administer remedies in these cases in sufficient quantities to procure their full physiological effects, he ought not to attempt to treat patients of this class. We must meet conditions as we find them.

In severe attacks of hepatic or renal colic, if we seek to relieve the patient with morphine, more than an ordinary medicinal dose is required. One-fourth grain of morphine is a fairly effective dose in most conditions in which that remedy is indicated, but in severe attacks of hepatic or renal colic the experienced physician would not depend upon a dose of that size. He would more likely give ½ grain as an initial dose, wait fifteen to thirty minutes, and if the pain was not arrested he would give ¼ grain more, and this would probably have to be repeated once or twice before complete arrest of pain ensued.

In such conditions it often requires three or four times the ordinary dose of a narcotic to so blunt the sensory centers as to make the terminal nerve branches tolerate the presence of an imprisoned gall-stone without sending up painful sensory impressions. Conversely, when we seek to arouse to activity motor centers which are profoundly blunted by the effects of narcotics, we must give a sufficient quantity of the appropriate remedy to bring about that result.

This is not rashness, but is simply rational therapeutics. Medicines are given for their effects, and the quantity required to produce a given effect is governed by the condition of the patient, as well as by the other physiological conditions known to affect the action of remedies. But as the physiological laws governing the action of purgatives will be considered more at length in a separate chapter in this volume, nothing more will be added on that point at this time.

Very erroneous ideas have existed, and still exist, as to the office and value of hyoscine (scopolamine) in these cases, and the most extravagant claims have been made for it. Many of these claims are based upon a total misconception of the principles underlying the successful treatment of narcotic addiction.

In the author's original paper no claim was made for hyoscine (scopolamine) except that it relieved pain and served to bridge the patient over a period during which he would suffer intensely without it. It was claimed for it that by preventing the suffering during this period it protected the patient from undue nerve strain and from the exhaustion incident to the withdrawal of opiates; also that it aroused certain nerve-centers which the opiate had blunted.

To these three claims we might add that of secondary stimulation of the secreting and excreting organs. In these particulars and to this extent hyoscine (scopolamine) is a curative remedy in drug addiction, but it is not, in the opinion of the author, curative in any other sense.

Soon after the appearance of the author's first article, in which he brought hyoscine (scopolamine) to the attention of the profession as a useful remedy in the treatment of morphinism, Lott, of Texas, published an article on

the treatment of drug habits (addiction) in which he made extravagant claims for hyoscine.

He brought hyoscine forward as an antidote for morphine, claiming it to be "a specific cure of the morphine habit."

In his article he says that he can give no explanation of its curative effects, but, depending upon the empirical experience acquired in the treatment of 25 cases, he makes the assertion that it is "an antidote for morphine" and insists on its free administration, believing it to be the sole curative agent.

He says this cure is effected without pain. That it may be seen how painless a cure of the morphine addiction is when hyoscine is depended upon as the sole curative agent, the author will quote from Lott's paper. He says:—

"In treating for opium or any of its preparations there should be nothing given to cause the bowel to move, for as soon as the morphine is out of him, during his second day, a bilious diarrhea sets in that will worry the patient a good deal."

Of the condition of the patient at the end of the period during which he gives hyoscine, Lott says:—

"Thus far all is well, the patient has been relieved from the drug, but he is not cured. It will take him a long time before his cure is completed and often his courage and fortitude is taxed to the utmost. It is true he has escaped from morphine *without pain,* but he will not be able to rebuild the shattered constitution without more or less suffering. The functions of the body so necessary to health having been impaired, appetite, digestion, assimilation, sleep, proper equipoise of the nervous system are to be restored. Not only so, but often for the first week, or for that matter the first month, there is pain in the back and knees, feet and arms, sometimes quite severe."

This does not sound to the author as if the patient had been "cured without pain." While the doctor says, "The patient has *escaped* from morphine without pain," we ask the question: Is it possible that, while he was escaping, some other blighting disease fastens itself upon him and is the cause of all this suffering?

Or, can all this pain and discomfort be a necessary part of the reconstructive process that lies out before him? Is the reconstructive process a painful one? Not so, but with all charity it must be said that the marked discomfort of the patient is mainly due to the neglect by his physician of one of the fundamental doctrines of medical science, that is, that retained excrementitious matter greatly aggravates and intensifies any disorder to which the human economy is liable, and that its removal is the first and often the most essential step in treatment.

Following the teachings of Lott, Behring, Stockard, and others have written articles advocating the use of hyoscine (scopolamine), insisting that it is "a specific cure of the morphine" addiction. Behring claims that it is as much of a "specific for morphinism" as "quinine is to malaria."

Some of these writers give Lott credit for first bringing it to the attention of the profession as a means of controlling the suffering incident to the abrupt withdrawal of opiates; but as the author's paper appeared before that of Lott, it is evident that this claim is erroneous.

However, the author has never claimed hyoscine (scopolamine) to be a specific cure for the morphine addiction (disease). He does insist that it is a useful remedy. He claims that no remedy for any disease gives better results than hyoscine (scopolamine) in the

treatment of morphinism, but the fact that it meets certain indications in the treatment does not, in any sense, make it a specific cure for this ailment.

The gradual reduction method of treating morphinism should be discarded as useless, and even hurtful; the sudden withdrawal without some agent to relieve the patient's suffering is inhumane and dangerous. This leaves the rapid reduction as the only one of the old methods worthy of consideration; but in this the patient suffers so intensely and the result is so seldom a cure that it certainly cannot be regarded as a satisfactory or successful treatment. Any remedy or course of treatment capable of robbing the sudden withdrawal of morphine of its horrors of suffering and dangers to life should be regarded as a Godsend to humanity.

After the patient is prepared for it, the discreet administration of hyoscine accomplishes this result.

The painful symptoms incident to the abrupt withdrawal of morphine have a natural limit of a few days' duration. By the discreet administration of hyoscine (scopolamine) these days may be passed in comfort and the patient thereby be protected from the nerve strain and shock which would otherwise attend such an ordeal of suffering.

Hyoscine (scopolamine) not only occupies, but fills, when properly used, as important a place in the treatment of morphinism as does chloroform or ether in the practice of surgery. Its office is very similar to theirs. It saves the patient from indescribable suffering and renders the unsafe, impracticable, and difficult, safe, practicable, and easy.

But the principal curative agents are the purgatives given at the beginning of the treatment. Without thorough elimination the hyoscine (scopolamine) does not

cure or bring relief to the patient to such a degree as to enable him to recover his health.

Any course of treatment which, afterward, involves such protracted suffering as is involved in the withdrawal of morphine when hyoscine (scopolamine) alone is depended upon to effect the cure is unreasonable, and must necessarily be unsuccessful.

The diarrhea, nervousness, sleeplessness, absence of appetite, and the numerous nervous symptoms which necessarily grow out of the poisoned condition of the system are such as to break down the strongest person. Before the system can right itself by nature's efforts unaided this ordeal of suffering brings the patient to the point of desperation, and in this desperate state resort is made to some pain-relieving drug and this usually arrests the convalescence. In order to cure these patients, in fact, to cure any disease, the cause must be removed.

The extremely toxic condition of the system is the principal cause of suffering in these cases. When this toxic state is overcome by a properly directed course of elimination, then hyoscine (scopolamine) plays its rôle as an aid to help bridge over a period which it would be extremely difficult to pass without it. This is enough to claim for any remedy and it is all the author feels that anyone should claim for this one.

Hare, at one time, was led to make excessive claims for the effects of hyoscine (scopolamine). In commenting upon the article of Lott, Hare says, "A patient can take massive doses of hyoscine (scopolamine) for days at a time, as much an one quarter of a grain per day, without evil effect on any of the vital functions." He further notes the fact that the administration of hyoscine (scopolamine) overcomes the craving for morphine.

The author, at that time, called attention to the lack of conservatism in this statement and pointed out the dangers which would be likely to follow its adoption, noting especially that it would be dangerous to give a patient who is addicted to any form of alcoholism $\frac{1}{100}$ grain of hyoscine (scopolamine) every hour for days at a time.

These *rash* claims for hyoscine (scopolamine) have led to the indiscreet and unnecessarily free use of this agent and have brought it into disrepute in the hands of many good men.

These results were not the fault of the remedy, but were due to its being administered to persons who had not been put in condition to take it without untoward effects and to its excessive administration.

Believing hyoscine (scopolamine) to be a specific cure for the morphine addiction, it was given with the idea that *it cured,* and this led to its administration being pushed, in some cases, out of all reason.

The author reviewed the papers of Lott and Hare soon after their appearance. The comment then made is still pertinent and it is here, in part, reproduced. Two articles have appeared in medical literature that deserve particular attention and invite some criticism. One of them is from the gifted pen of H. A. Hare, entitled "A New Method of Treating the Morphin and Alcohol Habits"; it was published in the *Medical News* on June 7, 1902. The other, treating of "The Drug Habit and its Cure without Pain," is by M. K. Lott, of Cameron, Texas. This was published in *Therapeutic Gazette,* Feb., 1902.

These articles are both on the use of hyoscine (scopolamine) for the treatment of drug and liquor addiction, and are valuable contributions to our literature. At the

same time, they contain certain statements which, to say nothing worse, are likely to impair their usefulness.

Lott reports the treatment of a series of cases of morphine and whisky addiction with hyoscine, and Hare says:—

"I have tried this plan in 6 cases with extraordinary results, from the following points of view:—

"1. The patient can take massive doses of hyoscine for days at a time, as much as one-fourth of a grain each day, hypodermically, with no evil effect on any vital function.

"2. They suffer very little, if at all, from the immediate withdrawal of morphine.

"3. And more surprising, the desire for the drug is largely, if not entirely, dissipated after a few days."

While the author can confirm the second and third of these statements, it is evident that the first is so broad and sweeping that it should not go without challenge, since, if it were followed, it would inevitably result disastrously and soon bring a most valuable plan of treatment into disrepute, if not into round condemnation.

This comment was made at the time and the predictions have proven true. It is unfortunate that such a statement should have been made by one occupying the position and speaking with such authority as does Hare.

One-fourth grain of hyoscine (scopolamine) administered in twenty-four hours is a little more than $\frac{1}{100}$ grain each hour.

The author has had quite an extensive experience with this drug and has watched its effects very closely. During the last twelve years the author has treated more than 3000 cases of narcotic addiction in which hyoscine (scopolamine) has been used freely, and, basing an opinion upon that experience, is prepared to say that

there are many more people who cannot safely take $\frac{1}{100}$ grain of hyoscine (scopolamine) every hour for days at a time than there are who can, with safety, take that quantity; and, that such dosage, routinely administered, as advised by these gentlemen would frequently prove fatal.

The effects of no other drug in our entire materia medica vary so greatly with different individuals as do those of the belladonna group of remedies: none require such close and discriminating care in their administration.

To illustrate the wide differences in the effects of these drugs on different individuals, and to show that their prolonged administration in the treatment of morphinism is not necessary, clinical notes of a few cases are given in the following chapter.

CHAPTER IV.

TREATMENT (CONTINUED).

CASE REPORTS, ETC.

CASE I.—Mrs. B., aged 52 years; weight, 140 pounds, had a morphine habit of fifteen years' standing. Her daily quantity was 10 grains taken by mouth in two doses. She came for treatment October 9, 1899. The usual dose of morphine was given at 3 P.M. Patient received a Turkish bath, was deprived of her supply of morphine, and placed in room specially prepared for her, with a trained nurse in constant attendance. From 4 to 10 P.M., purgative course of calomel, cascara, strychnine, and ipecac was given.

The next morning this was followed by a full dose of castor oil, and later by a bottle of citrate of magnesia, from which the bowels were thoroughly emptied by 8 A.M. The bowels having acted freely, there was no demand for morphine until 2 P.M., at which time she said she was nervous and aching and wanted a dose of her drug. At that time her pulse was 65, full, and regular; respiration, 18; skin moist, but not sweating. At 2 P.M., she was given $\frac{1}{100}$ grain of hyoscine, repeating the dose at 3 and 4 P.M.

The author then left the patient, expecting to return in two hours, but shortly before that time had expired he was hastily called to see her. He found her profoundly narcotized, breathing stertorously 8 to 12 per minute, with lower jaw dropped, skin bathed in perspiration, pulse 40 to 50 and irregular. She could not be aroused to any degree of consciousness.

The administration of restoratives, such as caffeine, strychnine, nitroglycerin, hot applications to spine, etc., was at once begun, and was continued for three hours. At times there seemed

to be some improvement, but soon these signs would disappear, and at the end of the third hour of these efforts her condition was decidedly more perilous. Patient very much cyanosed; breathing more irregular and only 6 to 8 per minute; pulse more irregular and of less volume.

At times responding to the stimulants, the pulse would run up to 60 or 70 to the minute, and would then drop back to a much slower rate, at one time being as low as 38 per minute. It seemed that all remedies at hand were failing, and that the patient would die in spite of all efforts to save her.

The excessive diaphoresis and failing pulse volume suggested the possible efficiency of saline solution. One quart of normal salt solution was injected into the cellular tissues, and the same quantity into the bowel with a colon-tube. In less than thirty minutes there were distinct signs of improvement; within an hour her breathing was fairly good, 12 to the minute; cyanosis had disappeared; pulse was 50 and of fair volume; sweating less profuse, and the extreme prostration had given way to a condition of fair tone. Her condition gradually became more normal. In three hours from the time the first salt solution was given it was repeated, and she was allowed to continue to sleep without efforts to arouse her.

From this time on, her condition was satisfactory; sleep was a little more profound than natural, but respiration and circulation were good. Sixteen hours from the time the last dose of hyoscine was given she awoke voluntarily, but was languid and drowsy for several hours more. At the end of this time she began to complain of pain in her back and limbs. One two-hundredth grain of hyoscine was given, and the dose was repeated in thirty minutes.

This gave relief which continued for a period of six hours, when the limbs were again uncomfortable. She said she had no desire for morphine, but would like to have something to stop the aching in her legs. One one-hundred and fiftieth grain of

hyoscine was given. This brought complete relief, and when the effects of this had subsided the pain did not return.

Not another dose of medicine of any kind was given in the case. She had no desire for morphine or any other stimulant, but expressed herself as feeling well and desired something to eat. Liquid nourishment was given and retained, and within three days she was eating heartily and said she enjoyed her food more than she ever had done before.

At that time to the author the most remarkable feature of this case was the fact that she could sleep from five to seven hours every night and then frequently take a nap of an hour or more during the day. She made an uneventful and rapid recovery, gained 30 pounds in flesh in four months, and has remained free from the morphine addiction from that day to this.

Her husband says that, instead of her former sedentary and seclusive habits, she now wants to be up and going all the time, and would not willingly take a dose of morphine even to save her own life.

There is little doubt that this patient would have died from the effects of the three $\frac{1}{100}$-grain doses of hyoscine given her had it not been for the happy effect of the normal salt solution. It evidently saved her life by increasing the volume of the circulating medium and by rendering less concentrated the narcotic poison it held.

The writer has had quite a number of patients who were extremely sensitive to the effects of hyoscine, but the following case shows about as marked intolerance as any:—

Case II.—Mrs. E. D., aged 30 years, blonde, weight 125 pounds, had a morphine habit of thirteen years' standing, her daily quantity being 20 grains taken hypodermically in three doses. From 4 to 10 P.M., July 27, 1901, a mercurial and vegetable cathartic was administered; also a vapor bath.

The last morphine, 7 grains, was allowed at 6 P.M. At 7 o'clock the following morning, 2 ounces of castor oil were given, followed two hours later by a bottle of citrate of magnesia. The bowels began to act at 5 A.M., and between that time and noon six free evacuations occurred. Patient was fairly comfortable during the time, and did not ask for her drug until noon.

At 12.25 P.M. she was given $\frac{1}{150}$ grain of hyoscine and 1 grain of sparteine. In thirty minutes the patient was asleep, and she slept an hour. Face was deeply flushed; respiration and circulation slightly accelerated. She awoke at 2 P.M., when her mind was clear. Then she complained of aching of limbs.

At 2 P.M. she was given $\frac{1}{100}$ grain of hyoscine, after which she fell asleep again, and slept about an hour. On waking, her mind was wandering, and she continued in a mild, loquacious delirium until 6 P.M., when the mind began to clear, and as consciousness returned she said she was uncomfortable.

At 9 P.M. she was again given $\frac{1}{150}$ grain of hyoscine. Delirium was fully re-established in thirty minutes, and for several hours it was of a more marked type, continuing without material abatement until 6.30 A.M. At that time she was in a measure conscious, complained of some discomfort, and said she would take morphine if she had it.

At 7 A.M., July 29th, $\frac{1}{200}$ grain of hyoscine and 1 grain of sparteine were given. Delirium recurred in a short time, continuing without any sign of abatement during the entire day, and even the next morning, twenty-four hours after the last dose of hyoscine had been given, her mind was not entirely clear. During this time, although she had some lucid moments, she did not complain of any pain or discomfort whatever, and said she had no desire for morphine. No medicines of any kind were given during this day.

July 30th, the fourth from the beginning of treatment, she took liquid nourishment, suffered no pain or even discomfort, showed no abstinence symptoms of any kind, and, while she said

she felt weak, she had no desire for morphine. A bath was given morning and evening, she sat up most of the day, and slept between four and five hours that night without medicine of any kind, nor did she sleep less than that any night thereafter. She remained in the institution three weeks. By the end of the first week her appetite was ravenous; she could eat with impunity anything she was allowed; had no diarrhea or other complication, and gained flesh at the rate of ½ pound a day. At the end of the third week she was discharged, looking like an entirely different woman. At no time had she any desire for morphine, nor did she show any inclination to take other stimulants.

This case is remarkable because of the extremely small quantity of hyoscine required to bring the patient well under its influence, and for the length of time the effects of the drug continued. This patient would most likely have been made violently delirious, and probably thrown into convulsions, from cerebral congestion, or have been dangerously narcotized, by the administration of $\frac{1}{100}$ grain of hyoscine every hour for even three or four hours in succession, not to speak of several days.

These two cases show the marked susceptibility of some people for hyoscine, and that the routine or careless administration of that drug is an extremely hazardous procedure.

There are others who have an unnatural tolerance for this drug. The following case shows remarkable tolerance:—

Case III.—Mrs. T. N., a blonde, aged 25 years, weight 120 pounds, five feet four inches in height, compactly built, was of a sensitive, nervous temperament. Her morphine habit was of four years' standing, and the daily quantity taken was 10 grains hypodermically, in four or five doses.

March 2, 1902, 4 to 10 P.M. Active purgative course of calomel, cascara, strychnine, and ipecac. Last morphine, 2½ grains, at 9 P.M. Vapor bath.

March 3d, 5 A.M. Bottle citrate magnesia.

7 A.M. Bowels have acted several times, but character of actions not altogether satisfactory. Is suffering and wants morphine. 7 A.M. Gave $\frac{1}{200}$ grain hyoscine.

7.30 A.M. Gave $\frac{1}{200}$ grain of hyoscine.

8 A.M. Gave $\frac{1}{100}$ grain hyoscine.

9 A.M. No perceptible effect from doses given. 9 A.M. Gave $\frac{1}{75}$ grain hyoscine.

9.30 A.M. Gave $\frac{1}{50}$ grain hyoscine.

10 A.M. Very little effect from preceding doses. Mouth slightly dry; is still suffering. 10 A.M. Gave $\frac{1}{50}$ grain hyoscine.

11 A.M. Gave $\frac{1}{50}$ grain hyoscine. Slept two hours; face flushed; mind clear; pulse and respiration slightly accelerated.

2 P.M. Gave $\frac{1}{25}$ grain hyoscine. Slept three hours; comfortable.

5.50 P.M. Gave $\frac{1}{25}$ grain hyoscine.

7 P.M. Gave $\frac{1}{50}$ grain hyoscine. Uncomfortable.

9 P.M. Gave $\frac{1}{25}$ grain hyoscine.

12 P.M. Gave $\frac{1}{25}$ grain hyoscine.

March 4th, 4 A.M. Gave $\frac{1}{25}$ grain hyoscine.

7 A.M. Gave $\frac{1}{50}$ grain hyoscine.

7.45 A.M. Gave $\frac{1}{25}$ grain hyoscine.

8.30 A.M. Gave $\frac{1}{25}$ grain hyoscine.

From 5.50 P.M. to 8.30 A.M. was quiet, but not entirely comfortable, sleeping at intervals; mind clear up to 9 A.M.

From 9 A.M. to noon mind wandered slightly, a very mild delirium, but at other times was entirely clear. Did not complain of discomfort until 1 P.M.

1 P.M. Gave $\frac{1}{25}$ grain hyoscine. Quiet and comfortable till 8 P.M.

8 P.M. Gave $\frac{1}{25}$ grain hyoscine. Nauseated.

9 P.M. Gave $\frac{1}{25}$ grain hyoscine. Slept two hours.

March 5th, 1 A.M. Gave $\frac{1}{20}$ grain hyoscine. Slept three hours, and on waking mind was clear. Was comfortable; pulse 60, good volume; respiration 20; temperature normal; skin moist. Craved lemonade and buttermilk, which were given, but vomited after an hour or so, and nausea continued most of the day. Vomited matter was green and offensive. As the day advanced she became more nervous and uncomfortable.

The bowels not having acted for thirty-six hours, and not very satisfactorily at the beginning of the treatment, 30 grains of hyposulphite of soda were given, and repeated every hour for four hours. The bowels then began to act, and a number of free bilious actions occurred. Nausea then ceased; there was no further marked discomfort in the case, and she made an uninterrupted recovery, never at any time expressing any desire for morphine, nor was that or any other medicine given. The bowels acted two or three times during each twenty-four hours, but no diarrhea or other complications occurred.

She did not sleep more than two or three hours at night for the first few nights, but gradually improved in that respect until at the end of ten days she was sleeping five to six hours out of the twenty-four daily.

The author can give no explanation of this patient's extreme tolerance for hyoscine. She had never taken hyoscine or any drug of that class with her morphine. She had been treated for morphine addiction about a year before she came to the author. She said that the physician who treated her said he had given her very large doses of hyoscine, but was never able to bring her under its influence sufficiently to keep her from suffering, and for that reason the treatment was abandoned and the use of the opiate resumed.

The author has had one other case that showed as great or even greater tolerance for hyoscine than this

one; but that patient had been taking an advertised "cure" for morphinism for several months and there is reason to believe that one of its ingredients was hyoscine. Large doses of hyoscine had no perceptible effect on him, and, after trying them until the writer was fully satisfied that he was a hyoscine habitué, a different line of treatment was adopted, to which he responded normally.

In the sixth case reported by Hare, he says that ten days after the beginning of treatment "the patient, while still receiving these massive doses of hyoscine, began to pass from under their influence, her tongue was moist, her mind clear," etc.

It is evident that in this case the morphine habit had been supplanted by the hyoscine habit. This patient was still receiving doses of this drug when the case was reported. From the course pursued in the first case reported by him, the author presumed that this drug was to be discontinued by gradual withdrawal.

In this connection the author enters a protest against such a procedure, and reminds the profession that there is nothing in this condition or in the nature of this drug to warrant the belief that the method of gradual reduction would be more successful as a treatment for the hyoscine habit than it has been for the morphine habit, in which it has been a stupendous failure.

If the example of Dr. Hare in giving hyoscine two weeks or longer, until tolerance for it is established, is followed, the hyoscine habit will soon be another curse with which unfortunate victims will have to contend.

There is no reason whatever for the administration of hyoscine in a morphine case for a longer period than two or four days, so far as the cure of that addiction is concerned. Forty-eight hours should be the extreme

limit as a rule, and that is longer than is necessary in most cases.

In an article published in the October, 1901, number of the *Therapeutic Gazette* the author contended for the following propositions:—

That abstinence symptoms, or the various manifestations thus designated, which occur upon the withdrawal of morphine, are due mainly to intoxication from effete material locked up in the system by the effects of morphine, and to the secondary effect of that drug.

That when a primary step in the treatment is thorough elimination of both the stored-up drug and the effete material with which these patients are surcharged, the most distressing and dangerous symptoms met upon withdrawal are avoided; that if the system is thoroughly freed from effete material, and morphine discontinued, all distressing painful symptoms subside within three days—as soon as the secondary effects of morphine are exhausted—*without further treatment of any kind.*

And that the essential office of hyoscine in the treatment of this ailment is to keep the patient from suffering *during that interval;* that as a rule all medication can and should be discontinued within four or five days.

Dr. Hare ignores these contentions altogether, and Dr. Lott takes a different position. He says: "In treating for opium or any of its preparations, there should be nothing given to cause the bowels to move, for as soon as the morphine is out of him, during the second day, a bilious diarrhea will set in that will worry the patient a good deal."

Thus, he waits for the system, released from the benumbing influence of morphine, to awake to the presence of the large accumulation of excrementitious matter and set up a diarrhea to throw it off, and allows this to

occur when the patient, recently deprived of the sustaining power of morphine, is least able to bear such drain.

But let us see what are some of the other results these gentlemen get from the treatment as they give it, and how long they are about it.

Dr. Hare says of his first case: "In this particular case the large doses of hyoscine were continued for a period of over two weeks and then were gradually decreased. It is now several months since the treatment ceased," and "I have seen this patient's physician during the last few days, and he tells me that not only is the man not taking morphine, but that he seems to be improved in every way, and has gained ten or twelve pounds in weight."

An average patient whose system is put in proper condition at the beginning of treatment, and to whom only what hyoscine and other medicine he needs is given, will gain flesh at the rate of ½ to 1 pound per day until his full normal weight has been reached, and his improvement in every other respect is so marked that the most conservative physician will say more than that he "seems to be improved."

In Dr. Hare's last case he says: "Twelve days after treatment began she asked for solid food." A patient of this class whose system has been properly cleansed of effete material and relieved from the effects of auto-intoxication at the beginning of treatment usually craves solid food on the fourth or fifth day thereafter, and by the end of the first week has an appetite that would do credit to a fieldhand.

The use of morphine interferes with the proper working of all excretory glands, and causes prolonged retention of the products of waste, resulting in profound intestinal and auto- intoxication. The effects of this are

so manifold and far-reaching that it is almost beyond human ability to enumerate them.

Suffice it to say that all the annoying and painful symptoms with which Dr. Lott says his patients have to contend are daily met with and are well understood to be the effects of systemic intoxication. It is also axiomatical that if the system is not too profoundly impressed nature will finally come to the rescue, and set up a diarrhea or other discharge to relieve the victim of this poisonous matter.

If nature is better prepared to do this unaided and alone than by the aid afforded by purgatives, diuretics, diaphoretics, etc., skillfully administered, then indeed have the fathers in medicine striven in vain to establish our art. Yet, notwithstanding these fundamental teachings, and notwithstanding that Dr. Lott recognizes the fact that the system of his patient is in a condition in which a diarrhea will soon be set up to clear it of offensive excreta, he advises that no purgative be given at the beginning of treatment, but waits to give nature a chance to do that work without assistance. This is certainly a strange doctrine, and yet here we have an eminent professor of materia medica indorsing it.

It does seem strange that in this age of the world it should be necessary for anyone to insist that as a primary step in the treatment of any disease the system should be cleansed as fully as possible of all retained excreta and other noxious matter. The universally recognized value of purgatives depends upon the fact that with their aid the system can be more readily, perfectly, and *economically* cleansed of retained excreta or other offensive matter than it can be by a diarrhea set up by the irritating action of these substances.

Diarrhea thus induced often runs a protracted course, and, if the purpose of nature is ultimately accom-

plished without artificial aid, it is by the most profligate expenditure of the patient's strength and other resources. In Dr. Lott's cases, nothing so retards their recovery or shatters their constitutions as does the diarrhea.

In the old methods of treatment, in which withdrawal of the drug was attempted without preceding elimination, diarrhea was one of the most trying and difficult complications to meet, and that which most often caused a return to the opiate.

Since this diarrhea can be prevented altogether by a well-directed eliminating course given at the beginning of treatment, and since this can be given without discomfort, *and when the patient is still under the sustaining influence of morphine,* why should it not be given? Not only does elimination prevent the diarrhea, but it gives many other advantages.

For one thing, it shortens the time during which it is necessary to give hyoscine or any other medicines. The patient, freed from irritating excrementitious matter, is far more comfortable, and has no such array of painful symptoms to contend with as Dr. Lott describes.

In order to show the contrast between a case treated with thorough elimination as the primary step and those reported by these gentlemen, the author will give the clinical notes of a case.

CASE IV.—Dr. F. C., aged 33 years, weight 150 pounds, nervous temperament, began the use of morphine in 1898, and gradually increased the quantity to 10 grains per day. In August, 1899, cocaine was added, and at the time of beginning treatment he was taking about 10 grains of each daily, divided into 10 to 15 hypodermic doses. He was rarely able to get to sleep before 2 A.M., because of the exciting effects of the cocaine, which was used up to about 9 P.M. and then discontinued until morning. He came for treatment January 9, 1900.

January 9th. Gave a capsule containing 2 grains of calomel, 2 grains powdered extract cascara, ⅛ grain strychnine, and ¼ grain ipecac at 4, 6, 8, and 10 P.M. The usual doses of morphine and cocaine were allowed until 9 P.M., and then discontinued. At this hour the patient received a Turkish bath.

January 10th. Had a very copious action from bowel at 5 A.M., and another at 6.15 A.M.

At 7 A.M. gave 3 ounces of castor oil, and between that time and 10 A.M. had five free bilious actions from bowel. No nausea or other distress attended the action of bowel.

11.30 A.M. Is suffering and wants morphine.

12 M. Gave $\frac{1}{200}$ grain hyoscine.

12.15 P.M. Gave $\frac{1}{200}$ grain hyoscine.

12.45 P.M. Gave $\frac{1}{150}$ grain hyoscine. Slept three and a half hours.

5.25 P.M. Gave $\frac{1}{150}$ grain hyoscine. Slept three hours; mind clear.

9 P.M. Gave $\frac{1}{150}$ grain hyoscine. Suffering.

9.20 P.M. $\frac{1}{150}$ grain hyoscine.

9.40 P.M. $\frac{1}{150}$ grain hyoscine. Slept three hours; on waking, mind is still clear.

January 11th, 1.15 A.M. Gave $\frac{1}{150}$ grain hyoscine. Suffering.

3.15 A.M. Gave $\frac{1}{150}$ grain hyoscine. More comfortable.

5.45 A.M. Gave $\frac{1}{150}$ grain hyoscine. Mind still clear.

6.20 A.M. Gave $\frac{1}{100}$ grain hyoscine.

8.40 A.M. Gave $\frac{1}{100}$ grain hyoscine. Comfortable.

10.40 A.M. Gave $\frac{1}{100}$ grain hyoscine. Mild delirium.

12.15 P.M. Gave $\frac{1}{150}$ grain hyoscine.

3 P.M. Gave $\frac{1}{150}$ grain hyoscine. Hyoscine discontinued. Delirium of mild type continued to 9 P.M., at which time the mind was about clear. Comfortable.

11 P.M. Gave 20 grains of trional. Slept three hours.

January 12th, 9 A.M. Legs and back aching; temperature 99° F. Gave 5 grains each of quinine and acetanilide at 9 A.M., 12 M., and at 3 and 6 P.M., but no other medicine.

8 P.M. Aching of legs and back relieved. Comfortable.

9 P.M. Gave 20 grains of trional.

January 13th, 9 A.M. Slept some last night, and rested quietly during the remainder of night. Ate breakfast with relish.

January 14th. Spent a comfortable day and night without medicine.

January 18th. The patient has taken no medicine in last five days and nights; feels weak, but does not suffer in any way; has no desire for morphine or cocaine, but, on the contrary, feels that their effects would be decidedly unpleasant to him now; eats heartily, goes to bed early, sleeps soundly all night, and says he feels like a new man. Is supremely happy, since he realizes that he is no longer a drug slave. Placed in charge of wife and sent home.

January 25th. At this date the condition of the patient may be judged by what his wife wrote to the author: "Doctor is doing nicely. If he improves in the next month as he has this week you will not know him. He sleeps well at night, gets up at 7 o'clock every morning, and seems perfectly comfortable. It seems so strange to see him up early every morning now, for when he was taking drugs he could hardly be gotten out of bed before noon. He is eating heartily, and everything seems to agree with him. His bowels have not given him any trouble at all. He says he has no desire for morphine or cocaine, and that he rarely thinks of them now. He left this morning for a week's hunt on the lakes."

January 30th. Patient visited the author at his office. He has gained 30 pounds in weight, and looks like a different man. He feels a return of his old-time energy, and is going to make up for lost time.

This case is fairly typical of a large percentage of those treated by the author's method, with the possible exception that this patient, being a morphine and cocaine habitué, regained his normal capacity for sleep-

ing a little earlier than patients do who have not been taking cocaine. There is certainly no such protracted painful convalescence as Dr. Lott says his patients have.

He attributes these painful symptoms to the presence of morphine in the system, but in this he is in error. Morphine in the system is not "the malady," and is not so much to be contended with as the effete material which it imprisons therein.

Another statement by Dr. Lott that should be taken with some degree of allowance is this: "Remember that hyoscine antidotes morphine and morphine antidotes hyoscine. If the patient gets too much of one, give the other."

This statement is entirely too broad. It is well understood that hyoscine and the entire belladonna series are physiologically antagonistic to morphine in a part of their range of action, but it is equally well established that in other respects they are synergistic. There is certainly no chemical antagonism between them; therefore, to say that they antidote one another is misleading.

They are both hypnotic, both anodyne, and both narcotic, and in these particulars they are synergistic. It certainly would not have been admissible to have given the patient first reported in this chapter morphine because she had too much hyoscine. She was already profoundly narcotized, and morphine would have intensified that narcosis.

There is no doubt that many cases of morphine poisoning are lost because of the too free administration of belladonna with the idea that it is an antidote. It certainly does not deserve to be so classed, and neither does hyoscine. In some respects and to a limited degree they oppose each other, but that is as much as can be safely said.

In the article referred to above it is said: "Hyoscine does not materially affect the vital functions, or leave after-effects on either the mind or body of the patient; therefore, it should be given until its full physiological effects are manifested if necessary."

But it is also said: "The administration of this agent should not be left to a nurse, but the physician should remain with the patient in person. The dosage in one case is no index to what will be required in the next. Only by the physician being present and personally observing the effects of each dose can the proper dosage be ascertained and the patient be kept in a comfortable and safe condition."

The writer still says that hyoscine can be safely administered until its full physiological effects are manifested; but there is a vast difference between the physiological or remedial effects of a drug and its toxic effects. The toxic effects of hyoscine are dangerous.

On account of the great difference in the susceptibility of different persons for this drug no fixed dosage can be stated in advance, and only by the physician remaining with the patient and watching the effects of each dose, at least until his tolerance or intolerance has been ascertained, can this drug be used to advantage.

This precaution should be exercised in every case, because some persons are so susceptible to hyoscine that it is a very delicate matter to develop its physiological effects on them without going beyond that point and getting its toxic effects. It cannot be administered in a routine manner with safety.

Another peculiarity of this drug, or of persons taking it, is that in some cases prolonged administration begets intolerance instead of tolerance.

This is rare, but in several instances it has been found that after the patient had been under the influence

of hyoscine for two or three days, and after all the visible manifestations of the drug, except dilatation of the pupil, had subsided, a very small dose, one-fourth to one-half the size of those given in the earlier part of the administration, was sufficient to fully re-establish the effects of the drug, and that the delirium induced by such a dose was more violent and prolonged than at the beginning. In such cases the prolonged administration would be dangerous.

CHAPTER V.

TREATMENT (CONTINUED).

CLINICAL NOTES, ETC.

THE cases reported in the preceding chapter, as well as the first case reported in this chapter, were treated during the early years of the author's experience in this line of work. A comparison of Case IV with Cases V and VI, which are also reported in this chapter, will show the difference between the author's present method and the one used in his earlier work.

The changes were made from time to time as clinical experiences pointed the way, and the author feels confident that each change was an improvement and that his present method is as complete and satisfactory in every detail as the present state of our knowledge will permit of its being made.

It will be noticed that in Case IV the patient was nauseated before the purgative began to act. A number of experiences such as this led the author to believe that the podophyllin contained in the purgative compound was the ingredient which was causing the nausea.

This ingredient was left out and cascara substituted. Patients taking this were less inclined to be nauseated. Later, rhubarb was discarded, as it also had a tendency to cause nausea in some cases.

After a careful trial of all the purgative agents in common use the following were selected as the agents most suitable for administration in narcotic cases: calomel, ext. cascara, ipecac, strychnine, nit. atropine sulph.

It is confidently believed that a combination of a suitable quantity of these five ingredients makes a purgative compound which acts on drug patients with the greatest certainty and efficiency and with the least tendency to nausea or other unpleasant symptoms.

It is a very rare thing now for a patient under the author's care to be nauseated or suffer any discomfort whatever from the effects of the purgative. A more full statement of his views on the actions of purgatives is given under that head in a later chapter of this work.

In Cases I, II, III, and IV it will be noticed that the opiate was discontinued at the time of giving the first purgative course, the withdrawal being abrupt and complete.

The treatment has been modified in that particular also. In the author's present plan more time is given to the preparation of the patient for the withdrawal and the withdrawal is made rapidly, but not at once.

Two or more purgative courses are given and the drug reduced materially following the action of each course, but the final withdrawal is not made until the system has been very thoroughly cleansed of toxic matter.

Since adopting this plan the author has found that his patients suffer much less during the treatment, less hyoscine, daturine, or scopolamine is required to keep them comfortable during the reactionary period following the withdrawal, delirium occurs less often, and when it does occur it is of a milder type and of shorter duration. The patient comes out from the active treatment in better condition and the convalescence is more rapid and is attended by fewer complications.

The blood-pressure record and pulse tracing given in Cases V and VI show more clearly than words can tell the safety of the treatment as at present administered.

The malarial complication noted in Case IV is one which frequently occurs in patients who come from malarial sections during the late summer or fall months. All such cases should be thoroughly cinchonized during or immediately following the withdrawal period.

Attention is called to the effects of overtaxing the digestive organs both in increasing the patient's discomfort and reducing his ability to sleep; also to the beneficial effects of an eliminating course under such circumstances.

The author points to the blood-pressure records and to pulse tracings given in the following cases as most convincing evidence of the correctness of his announcement, made eleven years ago, from clinical experience alone, without instrumental verification, to the effect that "deficient heart action leading to collapse in these cases is mainly due to portal engorgement, and that unloading the intestinal canal and relieving portal engorgement lessens the strain under which the heart has been working more than enough to compensate for the loss of any support it had been receiving from the effects of the opiate."

The author has uniformly found high blood-pressure in morphine habitués upon admission, but in every instance unloading the portal system was followed by marked reduction in blood-pressure, usually amounting to 30 to 60 mm. Hg. This reduction of arterial tension by the preparatory treatment, now instrumentally verified, is an essential factor in preventing collapse and other dangerous complications during the withdrawal period.

The author does not wish to be understood as saying that all morphine habitués coming under his care had blood-pressure higher than is shown by the average

person not taking morphine, but that in every case in which he has made blood-pressure tests the pressure was found to be higher in one taking narcotics than was normal for that particular person. The pressure in most cases, however, was much higher than the normal of a person of the same age not taking an opiate.

Patients admitted with a blood-pressure of 180 to 200 were usually found to have a blood-pressure of 140 to 150 after the system had been cleansed of toxic matter and the drug withdrawn. This lowered record, being maintained throughout convalescence, afterward showed that it was their normal blood-pressure when not taking an opiate.

If the patient upon admission had blood-pressure of 120 to 140, as soon as the system was cleansed of toxic matter and the opiate withdrawn the pressure would run down to 90 to 110. The fact that this lower record persisted throughout convalescence and after their entire recovery shows that the pressure of 90 to 110 was the normal blood-pressure, and that the reading of 120 to 140, while not ordinarily considered high, was higher than normal for that particular patient.

CASE V.—J. B. F., admitted July 1, 1903, male, aged 40, weight 140, height five feet ten inches. Began the use of morphine fifteen years ago during protracted illness (dysentery) and has used it continuously from that time until now. Now takes 30 grains per day, hypodermically, at five doses—6 grains at a dose, usually taken at 7 and 10 A.M. and 3, 7, and 10 P.M.

Aside from a loss of 35 pounds in weight, patient's general health did not seem to suffer much impairment from use of drugs; he was from a malarial section and thought he suffered from malaria at times, but did not have chills; heart, lungs, and kidneys normal; pulse rate, 72. Patient admitted 8 A.M., no noon

meal was allowed, and treatment was begun in afternoon by administration of

Calomel	gr. iij.
Podophyllin	gr. ¼.
Extract rhubarb	gr. ij.
Strychnine nit.	gr. $\frac{1}{10}$.—One capsule.

A capsule containing above ingredients was given at 4, 6, 8, and 10 P.M. Patient was given 6 grains of morphine at 10 A.M. and the same quantity at 3, 7, and 10 P.M., the 10 P.M. dose being the last morphine that was given in the case.

July 2d, 7 A.M. Patient had a good night's sleep and did not wake until 7 A.M., at which time he called for his morning dose of morphine; this was not allowed, but $\frac{1}{15}$ grain of strychnine was given hypodermically, followed in a few minutes by ½ ounce Rochelle salt. Patient was nauseated before this was given and the salt was vomited. Vomiting was attended by much distress; bowels not having moved, another dose of salt was given at 7.45 and electric massage of bowels used. 8.30. Large free movement from bowels occurred, nausea ceased, and patient became much more comfortable, bowels acted again at 9 and 9.45, both actions being free. Upon returning to bed after the third action, patient fell asleep and slept two hours, awaking himself at 12 M.; this was five and two hours, respectively, after the usual time for his morning doses of morphine, neither of which had been given, but at 12.30 he said he had gone as long as he could go without his morphine, and must have a dose. At this time his pulse was 90, temperature normal, was sneezing and yawning and skin was moist, but not sweating profusely.

1 P.M. Gave $\frac{1}{200}$ grain hyoscine hypo.

1.15 P.M. Gave $\frac{1}{200}$ grain hyoscine hypo.

1.45 P.M. Gave $\frac{1}{100}$ grain hyoscine hypo.

Soon after the second dose patient's skin became dry and the sneezing stopped, but he was restless and uncomfortable. Half an hour after the third dose was given patient's face was

flushed and pupils dilated; complained of his mouth and throat being dry, and was very restless.

2.45 P.M. Patient still restless and suffering; gave $\frac{1}{100}$ grain hyoscine.

3.45 P.M. Patient more comfortable, but still restless; mind clear; gave $\frac{1}{75}$ grain hyoscine.

4.45 P.M. Patient still awake, is restless, and, while he says he is not now suffering pain, he is evidently not entirely comfortable; mind is beginning to wander slightly; gave $\frac{1}{75}$ grain hyoscine.

5.30 P.M. Patient is delirious, talks at random, picks at cover, and tosses about on bed; his circulation and respiration are practically normal, pupils widely dilated, and face flushed.

9 P.M. Patient has been more quiet for the last two hours; delirium is less active and is not continuous; patient has lucid moments at times, and says he has pain in his back; asked for a drink of water and drank freely; passed urine.

9.30 P.M. Gave $\frac{1}{75}$ grain hyoscine.

July 3d, 1 A.M. Patient was very restless for about three-quarters of an hour after the 9.30 dose of hyoscine; then he fell asleep and slept an hour; soon after awaking, delirium became active and is still so; no medicine.

3 A.M. Patient has been quiet during last hour, delirium has partially subsided, and patient says he has pain in his back; gave $\frac{1}{100}$ grain hyoscine.

6 A.M. Patient was restless and tossed on bed for about half an hour after the last dose of hyoscine, but has not been so delirious; says now that his legs and back are aching; gave $\frac{1}{100}$ grain hyoscine.

9 A.M. Half-hour after the 6 A.M. dose of hyoscine patient said he was entirely comfortable; drank water and voided urine; mind wandered, but was not actively delirious.

11 A.M. Says he is uncomfortable and wants morphine; gave $\frac{1}{75}$ grain hyoscine.

12 M. Patient restless and uncomfortable; gave $\frac{1}{75}$ grain hyoscine.

1 P.M. Patient's restlessness was continuous for half an hour after noon dose of hyoscine; is now more quiet, but is delirious; lies on bed and picks at cover.

6 P.M. Patient's condition has continued as above until during the last hour; the delirium has partially subsided, and his mind is now clear at times; he says he is not suffering particularly, but would take a dose of morphine if he had it; gave $\frac{1}{75}$ grain hyoscine.

July 4th, 3 A.M. Patient was restless during the first hour after the 6 P.M. dose of hyoscine was given, during which time he was only slightly delirious, but in about an hour after that dose the delirium became more active and continued so for three or four hours, then the patient fell into a quiet, semiconscious state, and that has continued up to the present time. Patient lies quietly in bed, and has taken several short naps. When he is sharply aroused, he answers questions intelligently, but if left to himself he lapses into a semiconscious or mildly delirious condition.

6 A.M. Delirium has decreased during the last three hours, and patient's mind is now clear most of the time. His pulse is now 60 per minute, this being 30 per minute slower than at the beginning of the administration of hyoscine, but is of good quality. Respiration and temperature are normal. Patient says he is free from pain, but feels weak; he says he would like to have something to strengthen him, but does not want morphine.

6.10 A.M. Gave $\frac{1}{20}$ grain strychnine and $\frac{1}{2}$ ounce of Rochelle salt.

7 A.M. Patient is actively delirious again, doubtless due to the effects of strychnine in re-establishing hyperemia of the brain.

1 P.M. Active delirium continued four hours, but during the last two hours it has gradually subsided and the patient's mind is now almost clear; two movements from bowels have occurred

during the last hour; stools were very offensive and of an extremely dark color; patient has been nauseated and has just vomited a large quantity of green bilious matter.

2 P.M. Small liquid bowel movement.

6 P.M. Patient fell asleep at 4 P.M. and has just awakened. His mind is perfectly clear, and he says he is comfortable and has no desire for morphine, but would like to have something to eat; gave glass of milk.

7 P.M. Vomited milk and a quantity of green liquid.

9 P.M. Gave 20 grains trional and tub bath.

July 5th, 7 A.M. Patient went to sleep soon after coming out of bath and slept one and one-half hours; then was awake and restless until 4 A.M.; he then went to sleep and slept an hour and a quarter. Has been awake since that time. He says he is not suffering in any way, but feels weak; asked for cup of coffee. This was given and retained; says he has no desire for food.

7 P.M. Patient has had no medicine since 9 P.M. last night, at which time 20 grains trional were given. He was comfortable, took light nourishment several times during the day, but took it because the nurse insisted upon his doing so, rather than from a desire for the food; during the afternoon his temperature ran up to 100½° F. and he has complained of his back, limbs, and head aching; is now very uncomfortable and restless; gave ⅙ grain pilocarpine hypo.

7.30 P.M. Patient in profuse perspiration and has fallen asleep.

10 P.M. Patient slept two hours and ten minutes following the dose of pilocarpine; has just aroused and says he is not suffering. Temperature 98⅗° F.

10.30 P.M. Gave 20 grains trional.

July 6th, 7 A.M. Trional did not seem to have any effect on patient; he remained awake until 3 A.M. and then went to sleep and slept two and one-half hours. On awaking says he is comfortable and would like to have something more substantial to eat. This was given and he ate with relish.

7 P.M. Patient ate heartily at noon, but says he is suffering too much to eat supper. He was fairly comfortable during the forenoon; his temperature at 7 A.M. was 98⅘° F., at noon was 99⅕° F., and is now 100⅗° F. Pulse 90; respiration 20. He complains of aching of back, limbs, and head. Gave 10 grains phenacetin.

9 P.M. Patient still complaining; temperature 100° F. Gave neutral bath. Kept patient in tub thirty minutes, by the end of which time temperature had fallen to 98⅖° F.

July 7th, 7 A.M. Patient went to sleep soon after completion of bath and slept three hours, but has been awake since that time. Says he is not particularly uncomfortable, but does not feel sleepy. Bowels and kidneys have acted several times during the night; discharges from bowels are offensive; patient ate hearty breakfast.

2 P.M. Patient had chill at 1 P.M., and temperature is now 104° F.; is aching all over, and says he feels as if his head will burst. Gave 10 grains phenacetin.

4 P.M. Gave 10 grains phenacetin.

6 P.M. Temperature is now 100°, and patient is much more comfortable. Refilled purgative prescription given on the 1st inst., except that the strychnine in it was reduced to $\frac{1}{20}$ grain for each dose and gave capsule at 6, 8, 10, and 12 P.M.; also gave 40 grains quinine bisulph. by inunction in glycerin at 9 P.M.

July 8th, 7 A.M. Patient perspired freely from 11 P.M. to about 1 A.M.; he fell asleep at 12.30 and slept four hours; his temperature is normal this morning, and he says he feels comfortable. Gave $\frac{1}{20}$ grain strychnine and 2 ounces castor oil; also repeated quinine inunction.

12 M. Bowels have acted four times since 8 A.M.; the first two discharges were large, almost black, and very offensive; the last three were smaller, not so offensive, and show fresh bile.

7 P.M. Patient missed chill, has passed a comfortable day; his ears ring from the quinine, but otherwise he says he feels

better in every way than at any time since leaving off the morphine. His temperature is now normal and has not been above that at any time today. He was very hungry during the afternoon and has just eaten a hearty supper.

July 9th, 7 A.M. Patient went to bed at 9 P.M. and has slept all night; said he felt sleepy at 9 P.M. and no bath or sleeping powder were given. On awaking this morning he says he feels like a new man, and he certainly looks it. His skin has lost that muddy hue; his eyes are bright and clear, and his tongue is clean and breath free from offensive odor.

9 P.M. Patient has spent the most satisfactory day in every way that he has had since the beginning of treatment. Temperature has remained normal; no medicine has been given up to this time, but 20 grains bisulphate quinine are now given by inunction. This is done to avoid return of the malarial complication. Has taken three full meals today, but no medicine except the quinine.

July 10th, 8 A.M. Patient took tub bath at 10 last night and was asleep within half-hour after retiring and did not wake until 4 A.M. He then remained awake about an hour, and then slept from 5 to 6 A.M., making a total of six and one-half hours' sleep during the night. Says he feels better this morning than he has for many years, and that he has no desire whatever for morphine or other drugs; says he doesn't think of it now as a thing that would give him pleasure or increase his comfort; he says he doesn't want anything except three full meals today. This was allowed.

July 11th, 8 A.M. Patient's condition for last twenty-four hours has been entirely satisfactory; he spent most of day yesterday on lawn and in afternoon went to zoo, accompanied by his nurse. Upon returning he said he felt fatigued; his temperature was 99⅕° F., but other functions were normal; ate three full meals, but took no medicine until 9 P.M., at which time 5 grains quinine were given by mouth. Neutral bath at 10 P.M. was followed by good night's rest, with about five hours' sleep. Bowels

and kidneys are acting normally, and patient is gaining flesh rapidly.

July 14th, 8 A.M. No change in patient's condition during the last three days, except rapid increase in flesh and strength. The only medicine given was a 5-grain capsule of quinine each night until last night, at which time 30 grains of bisulphate were used by inunction. This being the seventh day from the time on which the malarial chill occurred, it was thought best to fully cinchonize the patient and thereby more certainly prevent a return of the malarial paroxysm. Patient's appetite is good, and he is sleeping five or more hours each night.

July 21st, 8 A.M. Patient missed chill on the 14th and has shown no malarial symptoms since. Quinine was omitted until last night, at which time 30 grains bisulphate dissolved in 2 drams warm glycerin were used by inunction. This being the fourteenth day from the time of malarial paroxysm, another would likely occur today unless prevented by quinine.

9 P.M. Patient passed time for chill without any symptom of malaria; his ears have been ringing from the quinine, but otherwise has spent comfortable day. Is eating heartily and sleeping from four to six hours each night.

July 28th, 8 A.M. Patient has not taken a dose of medicine of any kind during the last week until last night; today being twenty-first day from the day upon which the malarial chill occurred, or the third period at which a return of malarial paroxysm would likely occur, 30 grains quinine were given by inunction at 9 P.M. last evening. Patient lost weight during the first week of treatment, but has gained rapidly since that time. He now weighs 160 pounds, being a net gain of 20 pounds since beginning treatment. Has gained more than a pound a day during the last two weeks. He is still eating heartily, but digestion is not so good during the last week as it was before that time; complains of fullness of the stomach after eating and bowels act too often; in fact, he has a fermentative diarrhea, does not sleep as well as during preceding week.

A fast of twenty-four hours, to be followed by active cathartic, was ordered.

July 30th. Patient's fast and purgative have overcome all discomfort about stomach; also corrected the diarrhea.

August 5th. Thirty grains quinine by inunction given at 9 P.M. to complete cure of malarial complication. No other medicine.

August 12th. Patient has had no medicine during the last four weeks, except quinine for his malaria and a purgative to correct bowel disorder. He has continued to gain flesh and now weighs 175 pounds, a net gain of 45 pounds since he began treatment six weeks ago. He now looks the picture of health, but he has not gained strength as rapidly as he has gained flesh; however, as he intends to spend a couple of months in the country fishing and hunting, he is this day discharged from the sanitarium.

February 4, 1904. Patient in passing through the city called at sanitarium today. It has been a little over six months since he entered for treatment. He now weighs 190 pounds and is in perfect health. He says he remained in country and took much out-of-door exercise for over two months after leaving the sanitarium, but has been actively engaged in his business during the last three months; says he has not at any time had the slightest desire for morphine or any other drugs. He says he feels normal in every way and enjoys life more than he ever did. He says his years of slavery and suffering gave him a far greater appreciation of freedom and health than he had before he fell a victim to morphine. He is now, unquestionably, a very happy man.

CASE VI.—Mrs. R. A. Admitted January 21, 1912. Aged 40; weight, 135; height, five feet six inches. Family history good; mother of several children. Use of morphine begun ten years ago for relief of pain, it being first administered by a physician. The use has been continuous from that time till now. During the last two or three years from 12 to 20 grains have been taken daily

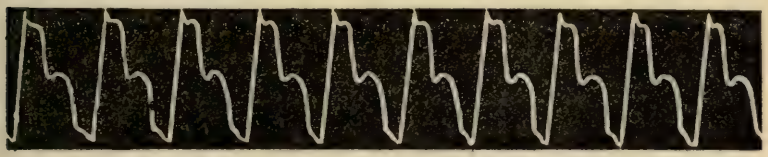
by mouth. This was usually divided into three doses, and these were taken a short time before each meal; none was taken during the night.

The following clinical notes give the treatment of this case in detail:—

January 22d, 8 A.M. 4 grains morphine by mouth.

9 A.M. Breakfast.

11 A.M. Physical examination. Temperature, 98⅖°; pulse, 84; blood-pressure, systolic 180, diastolic 130; pulse-pressure, 50. Tracing No. 1 taken.



Tracing No. 1.

12 M. 4 grains morphine by mouth (no dinner).

4 P.M. Tablet containing calomel, 2½ grains; powd. ext. cascara, 2½ grains; ipecac, ¼ grain; strychnine nit., 1/20 grain; atropine sulphate, 1/200 grain, given by mouth and repeated at 6, 8, and 10 P.M.

5 P.M. 4 grains morphine by mouth. No supper was allowed. Patient retired at 10.30 and slept till 5 A.M.

January 23d, 5 A.M. Gave 1/20 grain strychnine hypo.

5.30 A.M. Gave ½ ounce Rochelle salt.

6 A.M. Large movement from bowel.

7.30 A.M. Liquid bowel movement.

8 A.M. Bowel movement. No discomfort attended or preceded bowel movements.

9 A.M. Says she feels the need of a dose of her drug.

9.10 A.M. Gave 2 grains morphine hypodermically.

12 M. Pulse, 84; temperature, 98⅖°; blood-pressure, systolic 170, diastolic 125; pulse-pressure, 45.

12.30 P.M. Gave 2 grains morphine hypodermically. This served to carry the patient in comfort to the time of her evening dose, which was given at 6 P.M. Two grains were then given hypodermically. She was allowed light dinner and full supper, which was taken with relish.

January 24th, 8 A.M. Patient slept well all night, is hungry. Full breakfast allowed after giving 2 grains morphine hypo. Patient is menstruating, has menstruated occasionally, notwithstanding her use of the opiate. This flow lasted during the 24th, 25th, and 26th, during which days no medicine was given, except to continue the morphine in 2-grain doses, hypo., three times a day. These fully satisfied her, and she said she felt more comfortable than when taking it by mouth. The fact that her dose had been so greatly reduced was not made known to her.

January 27th. Menstrual flow having ceased, treatment was resumed. Breakfast was allowed on this day, but no dinner or supper. Two grains morphine at 7.30, 11.30 A.M., and 6 P.M. The 6 P.M. dose of morphine was the last opiate given in the case. Purgative course same as above was begun at 4 P.M., and tablet of size and strength above noted was given at 4, 6, 8, and 10 P.M., with tub bath at 8 P.M.

January 28th. Patient slept from 11 P.M. to 5 A.M.

5.30 A.M. Gave $\frac{1}{20}$ grain strychnine hypo., followed at 6 A.M. by ½ ounce Rochelle salt.

6.10 A.M. Large free bowel movement. No nausea or other distress.

6.30 A.M. Large bowel movement.

7.30 A.M. Free watery bowel movement.

9 A.M. Watery bowel movement.

9.30 A.M. Patient fell asleep and slept till 11 A.M.

11 A.M. Patient has just aroused from sleep. Examination at this time showed temperature, 98⅘°; pulse, 90; respiration, 24, and blood-pressure, systolic 140, diastolic 110; pulse-pressure, 30,

this being a reduction of 40 mm. in systolic pressure from record at time of beginning treatment. Tracing No. 2 taken.

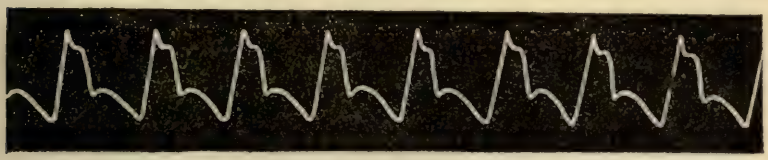
11.15 A.M. Says she is beginning to feel the need of morphine, but, instead of giving that, gave $\frac{1}{200}$ grain scopolamine hypo.

11.45 A.M. Gave $\frac{1}{200}$ grain scopolamine hypo.

12.15 P.M. Pulse, 90; respiration, 28; temperature, 98⅗°; blood-pressure, systolic 145. Patient resting quietly and is drowsy.

12.45 P.M. Gave $\frac{1}{200}$ grain scopolamine.

1.45 P.M. Temperature, 98⅖°; pulse, 100; respiration, 28; blood-pressure, systolic 130. Patient is quiet and sleepy.



Tracing No. 2.

3 P.M. Gave $\frac{1}{200}$ grain scopolamine. Patient had small bowel movement, and a few minutes after getting back in bed fell asleep and slept one and one-half hours.

4.50 P.M. Voided 4 ounces of urine. Drank glass of water.

5.40 P.M. Gave $\frac{1}{200}$ grain scopolamine; pulse, 100; respiration, 26; blood-pressure, 145.

8 P.M. Gave $\frac{1}{200}$ grain scopolamine.

9 P.M. Gave $\frac{1}{200}$ grain scopolamine. Patient says she is comfortable. Mind is perfectly clear.

11 P.M. Patient fell asleep soon after 9 P.M., and has just aroused from sleep. Says she is not suffering, answers questions intelligently, but when left to herself her mind wanders slightly. Is quiet and comfortable. This condition continued until 2.30 A.M., at which time her mind was practically clear and she said she was beginning to feel uncomfortable.

3 A.M. Gave $\frac{1}{200}$ grain scopolamine. Pulse, 100; respiration, 26; blood-pressure, 135. Patient voided urine and drank glass of water.

4 A.M. Gave $\frac{1}{200}$ grain scopolamine.

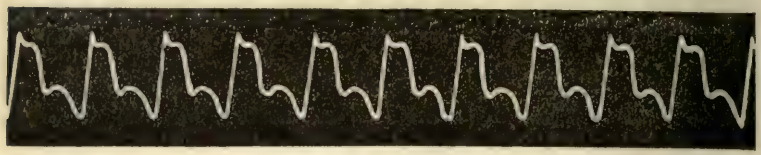
7 A.M. Gave $\frac{1}{200}$ grain scopolamine.

9 A.M. Patient was restless from 7 to 7.30, but has been quiet since that time. Is semiconscious. Temperature, 98⅖°; pulse, 88; respiration, 19; blood-pressure, systolic 140, diastolic 110; pulse-pressure, 30. Pulse tracing No. 3 taken.

January 29th, 11 A.M. Gave $\frac{1}{200}$ grain scopolamine. Voided urine.

2.30 P.M. Gave $\frac{1}{200}$ grain scopolamine.

9 P.M. Patient was restless from 2.30 to 3 P.M., but has been quiet since that time. Mind wanders and has been slightly



Tracing No. 3.

delirious, but when spoken to answers intelligently. Asked to be taken to toilet to void urine and drank water several times.

9.10 P.M. Gave ¼ grain podophyllin, 2½ grains ext. cascara, ¼ grain ipecac, $\frac{1}{40}$ grain strychnine, $\frac{1}{200}$ grain atropine by mouth, and a dose of this size was again given at 11 P.M. and 1 A.M.

January 30th, 6.30 A.M. Patient fell asleep at 3, and slept till 6 A.M. On waking, says she feels comfortable, but her mind is not entirely clear.

6.35 A.M. Gave $\frac{1}{25}$ grain gelseminine hypo.

7 A.M. Dark bilious bowel movement.

8 A.M. Says she is hungry. Gave milk toast.

9 A.M. Gave orange juice.

9.30 A.M. Mind perfectly clear. Gave general bath.

11 A.M. Pulse, 80; respiration, 16; temperature, 98⅖°; blood-pressure, systolic 140. Pulse tracing No. 4 taken.

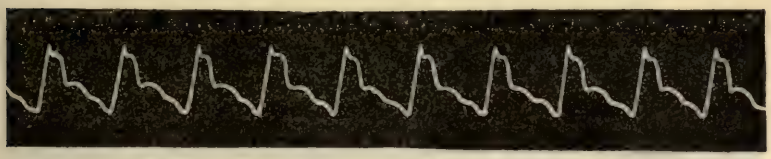
It is now forty-eight hours from time of beginning the administration of scopolamine. All symptoms of delirium subsided between 7 and 9 A.M. Mind is now clear, and she says she is entirely comfortable, and that she has no desire for morphine, but that she wants something to eat. Liquid nourishment allowed.

11.30 A.M. Free bilious bowel movement. Voided urine.

12.45 P.M. Patient fell asleep soon after returning to bed after bowel movement and slept an hour. Took soup and buttermilk with relish.

2.30 P.M. Lemonade given.

4 P.M. Patient slept from 3 to 4 P.M.



Tracing No. 4.

4.10 P.M. Small bilious bowel movement.

6 P.M. Temperature, 99°; respiration, 18; pulse, 80. Patient slept from 5 to 6 P.M.

6.30 P.M. Buttermilk and toast. Quiet and comfortable.

9.30 P.M. Gave 10 grains sulphonal.

January 31st, 6 A.M. Patient passed a good night. Went to sleep at 1.30 A.M., and slept until 5.30. On waking, says she feels weak, but has no desire for morphine or any other drug. Wants something to eat. Hot milk toast and an orange given.

8 A.M. Temperature, 99°; pulse, 92; respiration, 18; blood-pressure, systolic 140, diastolic 115; pulse-pressure, 25; urine scanty. Gave 2 grains sparteine by hypo.

10 A.M. Tub bath, following which the patient slept an hour and a half. On waking, says she feels well. Buttermilk and toast taken with relish.

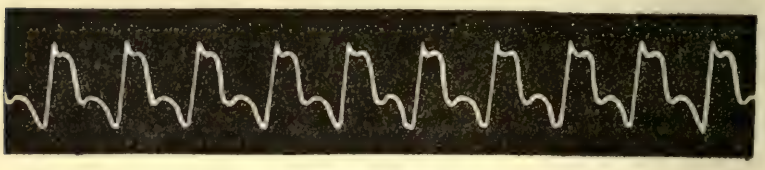
1 P.M. Gave 5 minims hydrochloric acid in fourth of a glass of water, followed by a light dinner.

6.30 P.M. Hydrochloric acid and supper. Spent comfortable afternoon.

10 P.M. Neutral bath. No medicine.

February 1st, 8 A.M. Patient went to sleep about half-hour after completion of the bath and slept most of the night without medicine of any kind. Is quiet and comfortable and says she is hungry. Full breakfast allowed, preceded by dose of hydrochloric acid. No other medicine.

11 A.M. Temperature, 99°; pulse, 88; respiration, 18; blood-pressure, systolic 155, diastolic 120; pulse-pressure, 35. Tracing No. 5 taken. Bowel and kidneys acting normally.



Tracing No. 5.

8 P.M. Patient has spent the day in comfort. Was given light dinner and supper; the only medicine given was the acid before each meal.

10 P.M. General massage and neutral bath.

February 2d, 8 A.M. Patient slept from 10.30 to 1 A.M., and from 3 to 6 A.M., making five and one-half hours for the night. Is up and dressed and was allowed to go to dining room for breakfast. Says she feels much stronger and will spend the morning in writing letter to her family.

11 A.M. Temperature, 99°; pulse, 90; respiration, 20; blood-pressure, 155. No medicine today, except acid before meals.

8 P.M. Temperature, 99⅗°; pulse, 95; respiration, 22; blood-pressure, 155. Patient has taken three full meals today. Is not so comfortable as on yesterday. Gave 10 grains aspirin to reduce temperature.

10 P.M. Neutral bath. The aspirin given at 8 P.M. reduced the temperature to 99°. The bath completed the reduction to normal.

February 3d, 8 P.M. Patient spent a comfortable night. Slept four hours after the bath and was awake then for couple of hours; slept again from 5 to 6 A.M. Patient put on a more restricted diet. No medicine today except hydrochloric acid before meals.

8 A.M. Temperature, 99⅕°; pulse, 88; respiration, 20; blood-pressure, systolic 150. Bowels and kidneys acting normally. Has been more comfortable than on yesterday. Temperature reached 99⅕° at 1 P.M., and remained stationary at that degree to 8 P.M. Gave 10 grains aspirin, massage, and neutral bath at 10 P.M.

February 4th, 8 A.M. Patient slept two and one-half hours after the bath, but on waking did not go back to sleep. Became restless and uncomfortable. Temperature was found to be 99⅘°. Gave ⅙ grain pilocarpine at 3 A.M. This was followed by free diaphoresis. Patient fell asleep at 3.30 and slept till 6 A.M.

February 8th, 8 A.M. The condition of the patient for the last three days has been practically the same as recorded on the 3d and 4th. The pulse rate has been from 85 to 95; respiration from 18 to 22; blood-pressure, systolic 150 to 155, diastolic 115 to 120; pulse-pressure, 30 to 35. Temperature usually 99° in the morning, running up to 99⅗° to 99⅘° by 1 P.M., remaining at this point during the afternoon and evening unless reduced by aspirin, pilocarpine, or a neutral bath or wet pack. When the temperature was not above 99° the patient was comfortable, but as the temperature rose even to three- or four- fifths of a degree above that she was conscious of it and was not so comfortable.

One or two doses of aspirin were given each afternoon. These served to reduce the temperature and make the patient quite comfortable. The neutral bath was used at bedtime as an hypnotic, as well as for its antipyretic effect. Patient slept from

four to six hours each night and expressed herself as being most grateful for the release from drug slavery. Appetite has been rather too good, and it has been difficult to keep her from overtaxing her digestive organs; in fact, success has not been attained in that effort, and it is evident that she is suffering from an acute intestinal toxemia. Bowels are loose and stools show fermentation. A fast of a day ordered.

February 8th, 3 P.M. The stomach being now empty, a purgative course, consisting of calomel 10 grains, ext. cascara 10 grains, ipecac 1 grain, strychnine nit. ⅛ grain, and atropine ⅟₅₀ grain, divided into four potions, was prepared and a potion given at 3, 5, 7, and 9 P.M. Fast continued.

February 9th, 6 A.M. ⅟₂₀ grain strychnine given hypodermically.

6.30 A.M. Bottle citrate magnesia.

7 A.M. Free bowel movement, and this was followed by three additional movements between 7 A.M. and noon.

1 P.M. Temperature, 98⅖°; pulse, 85; respiration, 18; blood-pressure, systolic 140, diastolic 110; pulse-pressure, 30. Temperature showed no change from the normal until 5 P.M., when it was 98⅘°. An aspirin capsule reduced it to normal. Patient has been quiet and entirely free from discomfort all day. Was allowed liquid nourishment at noon and light supper.

February 12th. Patient has spent the last three days in most satisfactory condition. Was much relieved by the action of the purgative given on the 8th instant. Has taken nourishment freely, but appetite has not been so ravenous since that time. Has slept from five to six hours out of each twenty-four, has spent most of each afternoon outdoors, she and her nurse attending matinees, visiting parks, etc. Temperature has not gone above 99° at any time since the action of the purgative given on the 8th instant. Patient has been entirely comfortable during these days and is gaining flesh and strength rapidly. At 11 A.M. today pulse is 85; temperature, 98⅗°; respiration, 18; blood-pressure, 140. Bowels and kidneys are acting normally.

February 18th. Patient's improvement has continued without interruption. No medicine has been given during the last week. Temperature has been normal most of the time, except late in afternoon, when a rise of two- or three- fifths of a degree has been noted. A neutral bath at bedtime has been sufficient to reduce this and procure good night's sleep. Appetite is good, but has been kept on a somewhat restricted diet.

February 27th. It has been a month today since the last dose of morphine was given. Patient now looks to be in perfect health, but when she attempts to do anything she finds that her strength is not sufficient to sustain her without feeling fatigue. Her present weight is 150 pounds, being a gain of 15 pounds since beginning treatment. Pulse, respiration, and temperature are now practically normal. Observations made at 11 A.M. daily have shown an average blood-pressure of 140, this being a maintained reduction of 40 mm. Hg from height of pressure when taking morphine. Patient says she can hardly realize that she was a slave to morphine and never thinks of it now as a thing that would give her pleasure. Patient put on a course of physical training, with restricted diet, but no medicine.

March 15th. Patient has gained in strength rapidly during the last two weeks, due largely to the systematic exercise involved in the course of physical training. Has only gained 5 pounds in flesh, and is now up to her full standard of weight when in health. Her bowels and kidneys are acting normally, appetite is good, and she is sleeping six hours or more each night without medicine of any kind. Not a dose of medicine has been given her during the last three weeks. Patient is now considered in safe condition to be discharged and she was sent home today.

AUTHOR'S COMMENT.

By reference to the clinical notes it will be seen that this patient was almost entirely free from discomfort during the first five days after the completion of the

active treatment period. During those days her meals were served in her room and she was kept on light and restricted diet, then she was allowed to go to the dining room and eat a liberal diet.

A few days of this liberal diet brought an increase in pulse rate, temperature, and blood-pressure, accompanied by the discomfort incident to acute intestinal toxemia. This discomfort was allowed to continue a few days, during which time no restriction was placed on the patient's diet and the discomfort of the patient increased each day. This course was pursued and this toxic condition was allowed to develop for the purpose of impressing a lesson which is essential to the safety from relapse of every drug patient.

Had this patient been left to herself, or had she applied to a physician for relief from these symptoms, some palliative would almost certainly have been resorted to that would have made bad matters worse.

After having permitted her to experience the discomfort due to acute intestinal toxemia the cause of her discomfort was explained to her, a fast enjoined, and this was followed by a physiologically balanced purgative course. The action of this purgative removed the cause of her discomfort and gave complete relief and not another unpleasant symptom developed in the case.

Acute intestinal toxemia developed earlier in this case than is usual. It could have been delayed longer by keeping her on a more restricted diet. The average patient if left to eat to satisfy the appetite, as they are disposed to do, usually develops acute digestive disturbances about the end of the second week after withdrawal of the drug. This can be put off to a later period by strict diet, but it can hardly be avoided altogether, and the author does not believe that it is best to try to avoid

it until the patient has been taught the lesson which it involves.

The stomach is no stronger than the balance of the body. During the first few weeks after being taken off of a drug, if the patient was called upon to do a full day's work, he would be quite unequal to it; yet if left to follow his own bent in the matter, he will eat so freely as to put a full day's work on his stomach each day.

The digestive organs may do this work for a short time, but, being overtaxed day by day, they must necessarily show the effect of such overwork and then acute digestive disturbances arise, but before these are marked enough for the patient himself to recognize them, or for a physician without experience in such cases to diagnose them, there will have been days and probably weeks of discomfort. This discomfort strongly suggests to the patient the need of his former drug and often leads to relapse.

The patient is certain to interpret this discomfort as being due to abstinence from his drug, and if the advice of a physician is asked he is more than likely to say that such discomfort is to be expected to follow the withdrawal of an opiate, etc.

With both the physician and the patient connecting the suffering with the former drug addiction, the chances are that each of them will reach the conclusion that, since the suffering is such as to demand relief, an opiate is the only remedy which can be expected to give that relief, and this leads to ruin.

As a matter of fact the suffering has no connection with the former drug addiction, except that the anemic condition incident to the use of the narcotic so impaired the activity of the digestive organs that they were unable to stand the tax placed upon them, and, as a result of this, deranged metabolism resulted in acute toxemia.

The condition should be recognized and attributed to its real cause, and not held to be a necessary sequel of drug addiction.

The treatment is rest for the overtaxed organs by two or more days' fasting, during which eliminants sufficient to fully cleanse the system from toxic matter are to be given. Under this course these symptoms disappear like magic, and the patient is ever afterward a wiser man and more ready to observe dietary regulations.

The author thinks it is best to allow every patient to overtax his digestive organs while in the institution and pass through this experience, as only by that means can the lesson be sufficiently impressed.

If he is kept on restricted diet while at the institution and thereby toxic conditions are avoided, he is sure to overtax his digestive organs as soon as he is thrown on his own resources and then he will begin to suffer, and suffering at such a time is dangerous.

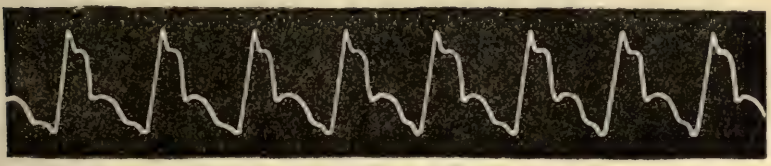
Such suffering reminds the patient of the sense of relief he formerly obtained from doses of his drug, and this is an oft-recurring autosuggestion to resort to it again. Therefore, every patient should be taught, in the most impressive manner possible, the nature of these toxic states, how to avoid them, the symptoms indicating their presence, and how to treat them when they do occur. Such instruction fortifies him against relapse to a greater degree than almost anything else that can be done for him.

Case VII.—J. H. H., male, aged 30, height 5 feet 8 inches, weight 150 pounds, admitted February 12, 1912.

History.—Began the use of morphine for relief of chronic dysentery six years ago. Bowel trouble disappeared about four months after beginning the use of morphine, but was then unable to give up the use of the drug, and it has been used hypodermi-

cally from that time until now, the daily dose gradually increasing until the quantity taken now is 30 grains per day. This is taken at four doses, one about 7 A.M., one at noon, one at 5 to 6 P.M., and one at bedtime, about 10 P.M. Has lost 30 pounds in weight, *i.e.*, much more than that was lost during the attack of dysentery. After that subsided, weight increased to 160 pounds, but did not go up to 180, which was his weight when in health. During the last two years weight has run down slightly and is now 150, this being 30 pounds below his standard weight when in health.

Physical Examination.—Heart and lungs normal. Kidneys acting normally, but urine is heavily loaded with indican. Bowels



Tracing No. 6.

habitually constipated; tongue furred; breath foul; pulse, 80; respiration, 16; blood-pressure, systolic 175, diastolic 120; pulse-pressure, 55. Pulse tracing No. 6 taken.

February 13th. Began treatment by abstinence from dinner and at 3, 5, 7, and 9 P.M. a purgative capsule made according to the formula given in the preceding case was given. 7½ grains of morphine were given at 5 P.M. and at 9.30 P.M. No supper.

February 14th, 6 A.M. Gave 1/20 grain strychnine hypodermically.

6.30 A.M. Gave bottle citrate magnesia.

7.30 A.M. Bowels moved very freely. No nausea or other discomfort accompanied the movement.

8 A.M. Another large bowel movement, after which patient fell asleep and slept until 10 A.M.

10.30 A.M. Free watery bowel movement. Patient quiet and comfortable. Is drowsy.

12 M. Patient says he has not missed the morning dose of morphine, but is now beginning to feel nervous and uncomfortable and wants a dose. At this time 3 grains of morphine were given hypodermically and patient given light meal.

5 P.M. Patient has spent a comfortable afternoon. It is now time for his evening dose. 3 grains morphine given and full supper allowed, which was taken with relish.

10 P.M. Gave 3 grains morphine.

February 15th, 7 A.M. Patient slept all night. On waking, his pulse is 70; respiration, 18; blood-pressure, systolic 150, diastolic 110; pulse-pressure, 40. Gave 3 grains morphine and allowed full breakfast.

8.30 A.M. Pulse, 80; respiration, 16; blood-pressure, systolic 160.

12 M. Gave 3 grains morphine. No dinner.

4 P.M. Gave purgative capsule same as above noted and repeated same at 6, 8, and 10 P.M. No supper.

5 P.M. and at 10 P.M. Gave 3 grains morphine, the 10 P.M. dose being the last morphine given in the case.

February 16th, 6 A.M. Gave $\frac{1}{20}$ grain strychnine hypo., followed at 6.30 A.M. by 2 ounces castor oil.

7 A.M. Free bowel movement.

7.45 A.M. Free bowel movement.

9 A.M. Patient has been asleep for the last hour. On waking, bowels moved again.

10 A.M. Gave $\frac{1}{2}$ ounce Rochelle salt and $\frac{1}{20}$ grain strychnine.

11 A.M. Free watery bowel movement.

11.30 A.M. Small watery bowel movement. Patient is quiet and comfortable. Is sleepy.

1 P.M. Patient has slept during the last hour. Is sneezing and yawning, but says he is not uncomfortable. Skin is dry. Pulse, 85; respiration, 20; blood-pressure, 130. Says he is hungry. Gave glass of buttermilk.

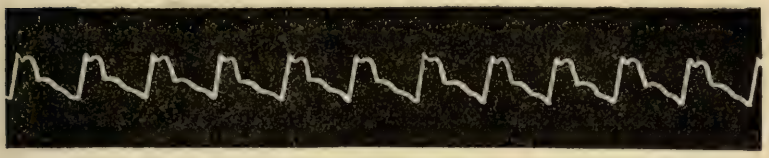
3 P.M. Patient has been asleep for more than an hour. On waking, he says he is beginning to feel the need of his drug.

Skin is moist, but is not sweating profusely. Pulse is 90; respiration, 22; blood-pressure, systolic 120, diastolic 100; pulse-pressure, 20. Pulse tracing No. 7 taken.

3.30 P.M. Gave $\frac{1}{100}$ grain daturine hypo.

4 P.M. Gave $\frac{1}{100}$ grain daturine hypo.

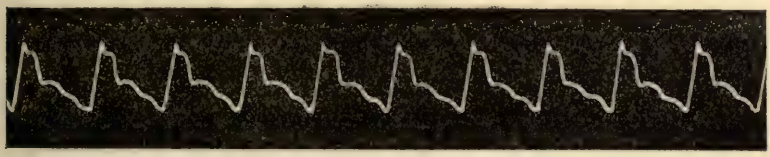
9 P.M. Patient was restless for about half an hour after the



Tracing No. 7.

4 P.M. hypo. was given, but before 8 P.M. had become quiet and fallen asleep and has just aroused. Pulse is now 80; respiration, 20; blood-pressure, systolic 130, diastolic 105; pulse-pressure, 25. Gave $\frac{1}{100}$ grain daturine hypo. Pulse tracing No. 8 taken.

February 17th, 3 A.M. About an hour after the 9 P.M. hypo. was given the patient's mind began to wander slightly and he



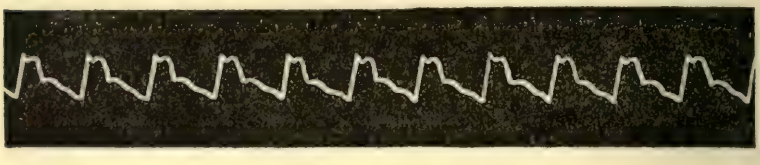
Tracing No. 8.

continued in that condition practically without change until within the last hour. He lay quietly in bed and would occasionally talk in an indistinct, mumbling voice, but at other times he would not speak or move for half an hour or more, was in a semiconscious or dazed condition. If spoken to he would, at times, make intelligent answers and at other times he would not notice anything that was said to him. He asked for water several times and voided urine. He has not complained of any discomfort until within the last hour. He now says he has some pain in the legs and

back and would like to have something for relief. Pulse, 76; temperature, 98⅘°; respiration, 16; blood-pressure, systolic 120, diastolic 98; pulse-pressure, 22. Pulse tracing No. 9 taken.

3.30 A.M. Gave 1/100 grain daturine and 60 grains sodium hyposulphite.

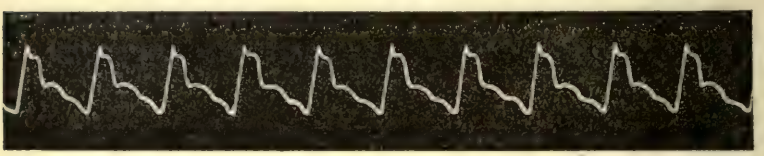
6.30 A.M. Within an hour after the 3.30 dose of daturine was



Tracing No. 9.

given the patient lapsed into a semiconscious dazed condition and has continued so since. He lies on the bed, talks to himself, and occasionally picks at the bed-clothes, but does not try to get out of the bed. Does not complain of anything.

9 A.M. No material change in condition of patient from that above described, except that his mind is becoming clear and



Tracing No. 10.

would like to have something to eat. Gave 30 grains sodium hyposulphite.

10 A.M. Patient's mind is entirely clear. He says he is not suffering, but feels weak, and thinks a dose of morphine would help him. Pulse, 78; respiration, 18; temperature, 98⅘°; blood-pressure, systolic 130, diastolic 105; pulse-pressure, 25. Tracing No. 10 taken. Gave 1/100 grain daturine.

11 A.M. Patient fell asleep about three-quarters of an hour after the last dose of daturine and is now in quiet sleep.

4 P.M. Patient slept two hours, but has been awake during the last two hours. Says he is not suffering. Drank water and voided urine. Gave 30 grains sodium hyposulphite.

6 P.M. Patient's mind has been entirely clear for more than an hour. Bowels acted at 5.30 P.M. Patient says he is not suffering, but would take morphine if he had it. Gave $\frac{1}{100}$ grain daturine and 30 grains hyposulphite of soda.

11.30 P.M. Patient's mind began to wander about an hour after the 6 P.M. dose of daturine and he is still in a semiconscious condition. He has not been asleep, but has lain quietly on the bed and talked to himself, mostly in a whisper.

February 18th, 2 A.M. Patient's mind is entirely clear; says he is comfortable, and would like to get some sleep. Gave 10 grains of veronal and 30 grains hyposulphite of soda.

10 A.M. Patient went to sleep at 3.30 A.M., and has slept soundly until a few minutes ago. Has just had a free, watery, bilious action from bowel. Says he is comfortable, has no desire for morphine, but wants something to eat. Gave glass of buttermilk and tub bath. Pulse, 70; respiration, 17; temperature, 98⅖°; blood-pressure, systolic 125, diastolic 100; pulse-pressure, 25.

6 P.M. Patient has been drowsy all day, has slept several short naps. Bowels have acted four times, the discharges being small and bilious, with sulphurous odor. Patient says he is perfectly comfortable, but feels weak. Is hungry. Has taken buttermilk several times during the day. Gave 2 grains sparteine sulphate by mouth.

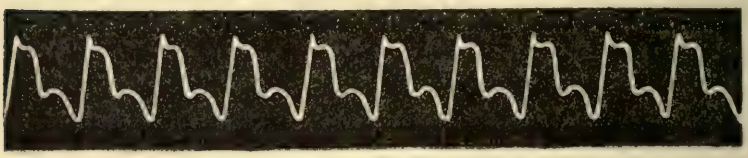
10 P.M. Gave 10 grains trional.

February 19th, 8 A.M. Patient passed a comfortable night, but did not get to sleep until 2 A.M. Slept from 2 to 6 A.M. Says he feels like a new man this morning and wants a full breakfast. Says he has no desire for morphine. His pulse, respiration, and temperature are normal. Blood-pressure, systolic 130, diastolic 102; pulse-pressure, 28. Light breakfast was given and patient was allowed to dress and get up.

8 P.M. Patient has been up and about the institution most of the day. Has spent a comfortable day and is certainly very happy in the realization of his freedom from drug slavery. Has not asked for or taken a dose of medicine of any kind today. Says he has no desire for morphine and does not want to take anything that is not actually necessary. There being no indication for the administration of medicine, none was given. His pulse is 75; respiration, 18; temperature, 99°; blood-pressure, systolic 130, diastolic 104; pulse-pressure, 26. Pulse tracing No. 11 taken.

10 P.M. Gave neutral bath and 10 grains trional.

February 19th, 8 A.M. Patient had comfortable night, went to



Tracing No. 11.

sleep soon after getting out of the bath, and slept three hours. Was awake then for about two hours. Slept again from 4 to 6 A.M. Has just come from dining room, where he ate hearty breakfast. Bowels and kidneys acting normally.

February 20th, 8 A.M. Patient's condition satisfactory in every respect today. Slept five and a half hours last night without medicine. He ate three full meals yesterday and entertained the other patients by playing the piano. He had no discomfort at all until about 5 P.M., when he said his head and knees ached. His temperature taken at that time was 99⅘°. Ten grains aspirin was given, and that relieved the aching. He had neutral bath at bed-time, but no medicine except the single dose of aspirin was given.

February 25th. Patient has gained in strength and weight during the last five days. Has taken no medicine, except a dose of aspirin occasionally in the late afternoon. Is eating all that he is allowed, and that is a fairly liberal diet. Has slept from four to six hours each night and has taken a short nap during

the day on three out of the five days. Says he has no desire for morphine and that he can hardly realize that he ever did have. Is certainly making an ideal patient and shows a determination to secure and hold complete control of himself that almost warrants permanency of cure.

February 29th. It has been two weeks today since the last dose of morphine was given in this case. He has regained the weight lost during the active treatment and has added 10 pounds to that, making his present weight 160 pounds. His mind is bright and clear, and he reproduces accurately pieces of music which he says he has not played for years. His appetite is good; in fact, rather too good, and he has overtaxed his digestive organs during the last few days. As a consequence his bowels are acting too often and he does not sleep as much as he did the first week. A fast of a day followed by a purgative was ordered.

March 26th. It has been six weeks today since the patient was admitted to the institution and over five weeks since he had the last dose of any kind of a narcotic. During the last four weeks he has taken no medicine, except a purgative on two occasions. His weight is now 175 pounds, being a net gain of 25 pounds since beginning treatment. During the last three weeks he has taken active outdoor exercise and says he feels as well as he ever did in his life and wants to go to work. Dismissed March 26th.

CHAPTER VI.

TREATMENT (CONTINUED).

TREATMENT OF DRUG DISEASE IN PREGNANT WOMEN, ETC.

IT would have been extremely rash to have undertaken to withdraw an opiate by any of the older methods of treatment from a pregnant woman habituated to its use. The sudden suppression of the drug is attended with such extreme distress that miscarriage would have been inevitable. The more gradual yet rapid withdrawal, as well as the gradual-reduction method, is attended and followed by diarrhea and other suffering of a type which would have almost certainly brought on abortion.

Under any of the methods of withdrawal which were undertaken with the idea that the drug itself, in the system, constituted the real disease, diarrhea of the most persistent and aggravated kind always attended and followed the undertaking. The intestinal contents were so acrid that, after the diarrhea had proceeded for a few days, the rectum became highly irritated, if not inflamed.

The connection between the nerve supply of the rectum and uterus is very intimate. A rectal tenesmus such as often attends diarrhea of this character would certainly excite sympathetic uterine action. Unless this was allayed by some drug of sufficient power to thoroughly benumb the nerve-centers, emptying the uterus would soon follow. Therefore, it was considered out of the question to suppress the use of a narcotic in a woman habituated to its use during the pregnancy.

With the method introduced by the author this is not the case. Pregnant women can be taken off of these drugs with entire safety, if a reasonable degree of precaution is exercised in handling such cases.

In preparing such a patient for the withdrawal of the drug, more time should be given in which to free the system of toxic matter and more guarded use of purgatives should be made; but purgatives must be used, because the irritating intestinal contents themselves, if allowed to remain in the bowel, will, as soon as the restraining effects of the opiate begin to die away, bring on an active and violent effort of the bowel to empty itself.

In this effort the system would likely go to such extremes as to greatly impair the vitality of the patient and bring on abortion. But if the system is properly cleared of the toxic matter, no diarrhea follows and no rectal or colonic irritation exists; therefore, no sympathetic uterine action is excited.

Pregnant women stand purgatives about as well as other persons do, provided all functions concerned in the evacuation of waste be stimulated proportionately and to a proper degree. The unnatural and unreasonable course almost universally followed by the profession, that of giving secretory stimulants and depending on them to also excite the motor function of the bowels, cannot be followed with impunity in pregnant women.

Again, it is well known that certain remedies used as purgatives are more drastic and irritating than others. Of course, these should be scrupulously avoided. The two that are in most common use which should not be given to pregnant women are aloin and podophyllin. These are objectionable when given to drug patients of any kind, but are especially so if given to a drug patient who is pregnant.

It is important when preparing the purgative for a drug habitué to compound one in such a manner that it will act promptly and freely, but the action of which will not be prolonged. Podophyllin is very much inclined to nauseate in its primary effects, and then its action is so persistent and continues to such a degree as to bring about irritation of the colon and rectum. Drug patients do not stand this well.

Calomel, cascara, and other ingredients noted in the prescription suggested as a purgative for drug patients can be given to pregnant drug patients without any likelihood of disturbing the contents of the uterus. But after the purgative has acted two or three times, if it shows any disposition to continue the action, then an opiate or some other drug should be given to check excessive activity.

It takes more time to prepare a pregnant patient's system for the withdrawal of the drug, but this can be done with safety by careful administration of the purgative, and then the drug may be withdrawn just as in other cases.

The administration of hyoscine or scopolamine may be carried on without any regard to the pregnancy. These drugs as completely arrest uterine action as do opiates. There is not likely to be any rebellion on the part of the uterus because of the withdrawal of the opiate if the patient is kept uniformly, but moderately, under the influence of a drug of this class for the two or three days succeeding the discontinuance of the opiate.

The author has taken a number of pregnant women off of morphine in this manner and has not had a miscarriage or even a symptom that threatened one. Of course, an undertaking of that kind is a delicate one and all precautions to prevent uterine action should be

used, but, while the author has used these precautions, they did not really seem to be necessary.

The uterus was as quiescent under hyoscine and after its discontinuance as it had been under the narcotic effects of the opiate. Some of the cases treated were only two or three months pregnant, while others were well advanced, even up to the seventh month. It is the author's rule to take every pregnant woman coming under his care off the drug.

If in the treatment of a patient of this class the uterus should become rebellious and symptoms of a miscarriage set up, of course, an opiate should be given if other remedies did not arrest this action, but this would not necessarily defeat us in our efforts at the withdrawal of the drug. A single dose, or several doses, given to therapeutic effect would not throw the patient back into the addiction. It would complicate matters somewhat and require a longer time to reach the normal, but these therapeutic doses of the opiate could soon be counteracted, and the patient still be brought to a condition of freedom. The author has never had to resort to an opiate in any case coming under his care and it is hoped, and believed, that others carrying out the plan of treatment will have similar results.

TREATMENT DURING CONVALESCENCE OF ADDICTION ACQUIRED IN AN ACUTE AILMENT.

In the treatment of acute painful ailments, such as threatened abortion, dysentery, cardialgia, renal or hepatic colic, etc., physicians are sometimes called upon to administer opiates at frequent intervals, if not daily, for several weeks or longer. It should be borne in mind that, if an opiate is administered daily for as much as four weeks in succession, addiction to the drug is fairly

established and if the patient be left to himself, and knows what he has been taking, he is more likely to continue to take it than to stop it merely because his physician instructs him to do so.

By the time a patient has taken an opiate daily for as much as four weeks, a toxic condition of the system will have been developed which will cause the patient to suffer upon the discontinuance of the opiate, even if all the painful symptoms of the disease for the relief of which the opium was given have subsided.

If the patient be discharged at this point, or allowed to have his own way, he is likely to continue to take some form of opiate and confirmed addiction result

In threatened abortion especially, it is often necessary to administer an opiate daily or oftener for a considerable length of time, in order to carry the woman to full term. In such cases it is best to continue the opiate for a few days after the confinement and then withdraw it, provided, of course, that no complication has grown out of the confinement.

If the confinement was a normal one and no complication has followed it, the patient should be in as good condition for the withdrawal within a week after the confinement as at any other time, and in such a case as this the physician attending can carry out the withdrawal successfully, but he must not shut his eyes to the conditions really present.

He must recognize the fact that the administration of the drug for the time it has been given has produced a real pathological condition, a general systemic intoxication, which will not vanish at his suggestion, and which will not be cured by merely stopping the use of the drug. There is more involved than merely stopping the drug, and the author would most strongly condemn

any effort to discontinue the drug by a mere gradual diminution of the dose.

The same objection obtains to the gradual reduction method of treatment in cases such as this, as in the more confirmed forms of addiction, and if possible these objections are stronger. In these cases there is no mental element in the addiction. The drug has only been used as a therapeutic agent and now that necessity no longer exists for its effects as such it should be discontinued, but in doing so particular care should be exercised to employ such a method as to avoid the development of a mental element.

The reader is referred to the chapter on Gradual Reduction Method for more full expression of the author's views as to the damaging effects of this method on the mind of the patient.

The therapeutic measures indicated in these cases are the same in every respect as are required in the more confirmed forms of addiction, and for these the reader is referred to the chapters on the Treatment. It should be borne in mind that the same toxic condition of the system exists in the recently formed addiction as in the more chronic forms and the same character of suffering will follow the withdrawal of the drug.

It is true that this suffering may not be as intense or prolonged, but it will be more than the patient can be expected to stand without assistance.

The principle in the treatment, therefore, is the administration of a physiologically balanced purgative in the afternoon, with the usual quantity of opiate up to bedtime of that day. On the following morning, strychnine should be given hypodermically and this followed by a dose of salts or oil. No opiate to be given on this morning until after the bowels have acted freely several

times; then the opiate should be given in about one-half the former doses. This to be continued on this and the following day.

Forty-eight hours from the time of giving the first purgative course, another of similar character should be given. The opiate should be given up to bedtime on this day, but that should be the final dose. This purgative course should be followed by strychnine and salts, or oil as before. When the second purgative course shall have acted freely, the principal obstacle of the withdrawal of the drug will have been eliminated from the case and the drug may be withdrawn with safety and with but little suffering, but it is best to protect the patient even from this suffering.

This can be done by the administration of small doses of hyoscine or daturine for a period of about thirty-six hours following the action of the second purgative course. After that no medication is indicated so far as drug addiction is concerned.

The principal difference between a recently formed and a chronic addiction is in the fact that in recently formed addiction the patient has not become so fully dependent on the drug and the mental element, the "mental habit," has not become such a dominating factor.

In such cases, when the physical demands for the effects of the drug have been overcome, the patient can be managed and controlled as any other convalescent patient and the physician who has succeeded in bringing the patient through the acute ailment which made the administration of the opiate necessary is in favorable position to administer the treatment indicated for the cure of the incipient addiction.

This should be done in every case before the patient is discharged from treatment. Merely instructing the

patient to stop the use of the opiate does not meet the physician's responsibility under such circumstances.

STRUCTURAL HEART LESIONS COMPLICATING MORPHINISM.

The author has frequently received inquiries as to whether or not a structural heart lesion would render it unsafe to treat a patient for narcotic addiction. There is no question but that a structural lesion renders the life of the patient uncertain at all times, but the author does not feel that it is at all a contraindication to the treatment of narcotic drug addiction; in fact, if anything, the patient is safer under proper treatment than while taking the opiate.

When the condition of the system of a drug user is considered, especially the portal congestion that is habitual, it will be readily seen that the heart is being taxed constantly to propel the blood through this obstructed area. This increased work is not compensated for by the effect of the drug to any great extent.

It is true that morphine is a heart tonic to a certain extent and doubtless in many conditions imparts greater vigor to the heart action, but the chronic, prolonged effect of morphine could not be so considered. Therefore, since the condition of the system induced by morphine puts more work on the heart, it is the opinion of the author that the patient is better off in every respect under treatment and afterward than he is when taking the morphine.

The first step in the treatment is to unload the portal system and free the patient from the accumulated toxic matter, and this reduces the work or removes the obstruction against which the heart is propelling the blood to a sufficient degree, in fact to more than a sufficient

degree, to compensate for any support the heart received from the narcotic.

After the period of elimination has been passed and the opiate is discontinued, then the next step in the treatment is to administer hyoscine, scopolamine, or some drug of that class and that is as good a heart supportive as is morphine.

But as an additional protective this should be supplemented by the administration of sparteine. Under the supporting action of these two remedies, the circulation is uniformly better, in fact more satisfactory in every way, than it is when morphine is being used and the heart is laboring under the toxic condition which it induces.

Of course, a patient with structural heart lesions of a serious type is always in more or less danger, but the author does not feel that such a person is in greater danger under proper treatment for the cure of the drug addiction than he was before beginning it.

The author has treated many cases with serious structural heart lesion, and, while he cannot help but feel apprehensive when he has such a case under his care, he does not feel that such a lesion should be regarded as a bar to treatment.

The care of such cases is a matter that would give anyone concern, but, since the object is to free the patient from a drug slavery which is almost, if not altogether, as bad as death itself, the undertaking is justifiable.

Of course, great caution should be exercised in the treatment of such a case. Longer time should be taken to prepare the patient for the withdrawal; even if it takes a week or two weeks to get the patient's system free from toxic matter, it is time well spent, especially so since during this time the patient's general condition

can be improved. But with the exercise of this precaution these cases bear treatment remarkably well.

AGE NOT A BAR TO TREATMENT.

The question is often raised as to the influence of age in determining the success in the treatment of drug addiction. How old may a person be and still be successfully treated for an addiction?

The question arises from the general belief that the withdrawal of a narcotic drug is attended by extreme shock and suffering which would be very dangerous for an old person to encounter. That is entirely true when any of the old methods of treatment are employed. Certainly no aged person should be expected to stand such an ordeal of suffering.

But with the rational method of treatment which removes the pathological condition involved as a primary step in the treatment, old persons can be taken off the drug as successfully as younger ones. Of course, the same moderation, the same caution in treating an old person for a drug addiction, should be used as would be requisite in treating such a person for any other ailment; but with the caution usually exercised by the profession in treating aged persons, drug addictions in aged persons can be successfully treated.

No one would think of allowing an aged person to continue to suffer from any ordinary ailment just because of his age; no more should allowing them to continue in drug slavery because of advanced age be thought of.

It may be suggested that they have but little time left, and that, inasmuch as they have been using the drug, many of them a long time, they should be allowed to go on without interference. This is an unsound position,

if for no other reason, because of the death that such persons will be called upon to die. The agony of suffering which is likely to precede it is almost beyond description.

The old person's system is as toxic as that of any other drug user. No other remedy will have a normal effect upon them as long as they are under the influence of an opiate. Therefore, when they do fall sick of any ailment, little relief can be given them. Even a larger quantity of the opiate than they are accustomed to taking gives them but little, if any, relief, certainly not enough to overcome the distress incident to the acute ailment. This holds good in the last illness as well as any other; in fact, it is more noticeable in that.

Almost all patients who are habitually under the influence of a narcotic, when seriously sick, suffer greatly, and before their death they usually suffer the most intense agony, many times dying in convulsions without the slightest relief being available for them. The only remedy which could be looked to for relief is chloroform or ether and no physician would be bold enough to anesthetize a dying patient.

Therefore, these patients, if left to continue the use of the opiate, must look forward to a most agonizing and horrible death. To allow them to face this and continue the use of the drug simply because they have not a long span of life before them is cruelty of the most extreme type.

The author has had patients of extreme age, one a Civil War veteran 79 years of age. This man was wounded during the service and for several years afterward suffered severely from complications growing out of that wound, and as a result of this he was given gum opium for relief. When he came for treatment he had

been using this drug constantly for 27 years and had reached the age of 79.

His treatment was carried out without the slightest complication. He suffered less from reactionary symptoms after the withdrawal of the drug than young persons do, and, while his convalescence was slow, it progressed without any complications and in a few months he was in fine health; in fact, in much better health than he had been for many years. After spending six weeks in the institution he went home and took up his farm work. After reaching home, he wrote back, saying: "if he knew he had only ten days to live, he would come back and be taken off that enslaving drug so that he might die free from its influence."

Of course, patients of extreme age cannot be expected to convalesce so rapidly from the anemic condition induced by the habitual use of the drug, but that would be true if they were sick with any other ailment. Therefore, their age is no contraindication to treatment. They should be given a chance for freedom and the author is able to say from observing the results in quite a number of aged persons that they almost invariably remain free from the addiction. This matter is more fully explained under the chapter on Prognosis.

The longest continuous use of the drug of any patient who has come under the author's care is forty-five years. This patient was 65 years old and had used morphine continuously from the time she was 20 years of age. She had tried a number of home treatments, but had never been free from the drug a day from the time the addiction was formed until she came for treatment.

She had a structural heart lesion and was subject to slight spasmodic asthma, but, notwithstanding these unfavorable conditions, her system was given a general

renovating and she was entirely freed from her addiction. Her convalescence was slow, but successful, and she was sent home a free and independent woman, and certainly as happy a person as could be found anywhere.

One set free from drug slavery after having been enslaved for such a period as this feels that he has been given new life indeed, and is as proud of this new life and freedom as any other slave would be who had been emancipated. Patients of this class who have been successfully freed from the addiction never cease to feel grateful to the physician who has brought them relief. The author is conscious of the fact that he has made stronger friends and more of them in this line of work than he could have done in any other field of activity.

Every drug patient is hopeless, so far as any tendency to self-recovery is concerned. All of them go from bad to worse and end in either an untimely grave or a mad-house. Acute ailments of almost all kinds have a tendency to self-recovery and a large per cent. of those who fall sick would recover, finally, without the aid of a physician. In drug cases no such tendency to self-recovery exists. Every case is in the class with persons who have a fatal malady which is only curable by the most radical surgical operation.

In such cases the daring surgeon goes in and with his knife removes the pathology and the patient's life is saved. Without this, he must necessarily have died untimely. This is equally true in drug cases, and active, intelligent interference is just as much indicated as the surgeon's knife was in the otherwise incurable ailment.

The pathology must be removed; then the patient has an opportunity to regain his health, but to be successful the undertaking must be carried out with the same degree of thoroughness with which the surgeon does his work.

The same intelligent care must be exercised to cleanse the patient's system from toxic matter, even down to the toxins stored in the most remote, ultimate cell, that the surgeon exercises to see that no break occurs in his aseptic technique.

CHAPTER VII.

CONSIDERATION OF THE REMEDIES USED.

PURGATIVES.

A THOROUGH, guarded, but effective use of purgatives is such an important factor in the successful treatment of narcotic addictions that the author feels compelled to discuss the physiological law governing the action of purgatives somewhat at length in this work.

In the opinion of the author no other subject connected with the practice of medicine is of equal importance; neither is there one but what is more perfectly taught, more fully understood.

The difficulty seems to arise from the fact that our medical teachers and writers take it for granted that everybody knows how to give a purgative, all "old women" know this, and certainly anyone presuming to take up the study of medicine should know that much to begin with. Therefore, the subject is not so thoroughly taught as its importance deserves.

In the author's opinion there are but few men in the profession who understand the action of purgatives sufficiently well to enable them to write for a purgative compound which will effectively and proportionately stimulate all the functions concerned in the evacuation of the bowel, and there are fewer still who habitually write their prescriptions so as to conform to that standard.

Purgatives occupy such an important place in the treatment of disease and have been and are so extensively used that it would seem that the principles upon which their action depends would long since have become a

matter of common knowledge, but experience has convinced the author that such is not the case. In the healing art, so much depends upon the practical application of these principles that every physician should aspire to a complete mastery of them and thereby be saved from dependence upon the half-knowledge of empiricism.

It should be remembered that the key to the secretory and motor activity of the intestinal canal, and of the glands emptying their products into it, is the nerve-centers. Success in any effort to secure evacuation of the intestinal contents depends upon the degree of success we have in arousing these centers to functional activity. Our success in that effort depends not only upon the condition of these centers, but upon the manner in which we attempt to approach them.

It appears that many of the agents causing disease in the human system exert a peculiarly sedative influence upon the nerve-centers presiding over the motor activity of the intestinal canal. As a consequence deficient peristalsis, manifesting itself in deficient alvine dejections, is an early symptom of almost all diseases.

This may or may not be accompanied by deficient secretion; but no matter how abundant secretion may be, if the motor centers are so blunted as to have their activity suspended and to be insensible to impressions conveyed to them, the intestinal tube becomes an inactive, motionless mass which effectively imprisons its contents.

In the treatment of disease, if we undertake to restore motor and secretory activity to the intestinal tube, we have four classes of agents which we may employ, or four modes of procedure at our command. By two of these we can stimulate the nerve-centers directly; the other two, indirectly.

Direct stimulation of the cerebrospinal centers, if sufficient, arouses all the cells in such centers to activity. As a result of this activity, secretory and motor impulses are generated and transmitted to all the structures deriving their nerve supply from such centers.

On the other hand, indirect or reflex stimulation of such centers, unless very extensive, only arouses a part of the cells composing these centers to activity. The motor or secretory response to such stimulation is local and not general. That this statement may be more clearly understood, the author will advance this proposition:—

The same law governs the generation and transmission of reflex motor impulses that governs the circulation of the blood: "Where there is an irritation, the blood will flow." Corresponding exactly to this, when the terminal filaments of the sensory nerves distributed to any particular structure are irritated that impression is transmitted to the centers. In response to this, motor impulses are generated and transmitted to the structure from which such sensory impression came, but to no other structure.

The action is essentially local. In other words, "the effect of a given sensory stimulus is manifested only on a limited and practically constant number of motor nerves." *If the sensory impression is made upon the nerves of a limited area, the motor impulse generated in response thereto will be reflected to correspondingly limited area.*

Much attention has been given to agents which stimulate secretion, and the individual peculiarities of these agents have been carefully studied, but little attention seems to have been given to the means of exciting the other function concerned in intestinal activity.

It is well known that deficient peristalsis retards bowel movements, and that if peristalsis is entirely suspended no movements occur, but little practical use is made of that knowledge.

Our entire therapeutic endeavor seems to be directed to the *stimulation of the secretory function,* while little, if any, attention is given to the *other essential function,* the motor activity of the intestinal tube.

The almost universal rule is to administer secretory stimulants (chemical irritants) and to trust to them, or to some vaguely defined or altogether unknown agency, to arouse the activity of the other essential function.

It is true that remedies which excite intestinal secretion do also stimulate motor activity of the intestinal tube, but the manner in which they do this is so inefficient and so poorly corresponds to the time at which such function should be active that it seems quite unreasonable to depend upon such an agency for the production of so important a factor.

The four modes by which the secretory and motor activity of the intestinal canal and of the glands emptying their products into it may be artificially induced are: chemical stimulation; mechanical stimulation; electrical stimulation; physiological stimulation.

CHEMICAL STIMULATION.

Chemical stimulation is the method almost universally employed; therefore, we shall first consider the action of this class of agents and the difficulties encountered in their employment; also the objections which exist *to their being depended upon* to stimulate the motor function of the bowel.

Let us see with what difficulty these agents accomplish this dual result. Take, for example, the cholagogue

cathartics. These cause a free flow of the biliary secretion. This secretion is poured into the duodenum, and there it comes in contact with the terminal filaments of the nerves distributed to the intestinal mucosa, to which it is a chemical irritant, but it can only stimulate these nerves as it is brought in contact with them.

When motor activity of the tube is suspended many difficulties lie in the way of its being distributed throughout the length of the tube. Instead of the small intestine being a straight, patulous tube through which its contents can readily pass, it lies in numerous convolutions, and at many points a short bend in the tube completely closes its lumen.

If peristalsis is suspended the downward passage of the intestinal contents is effectively blocked, thus confining any quantity of hepatic secretion which may have been induced by the action of cholagogue to the duodenum and such segments of the jejunum as it may have been able to reach.

If this secretion is abundant the obstruction to its downward passage causes overdistention of that part of the tube which it first reaches and in which it is confined. All the sensory nerves supplying this part send up repeated sensory impressions, and the reflex response to these at times amounts to spasmodic contractions.

These violent muscular contractions mechanically irritate the sensory nerves passing through or terminating in their fibers. This mechanical stimulation augments the already powerful chemical stimulation existing in the part. These, acting together, cause violent contractions of the tube, which force the contents both upward and downward.

If the segment which is thus irritated be near the stomach, bile and other intestinal contents are forced up

into the stomach. If lower down, these contractions straighten the bend in the tube immediately below this segment, thus allowing the contents to pass downward to another segment of the tube.

It is here again arrested and held until the irritation caused by its presence, reflexly, stimulates this segment of the tube to such degree of motor activity as to straighten the bend at its distal end and thus permit the further downward passage of the intestinal contents.

This phenomenon is repeated, segment by segment, until the chemically irritating intestinal contents have gradually, but with difficulty, worked their way through the entire length of the tube, and then, but not until then, does evacuation of intestinal contents begin.

It is evident that, *since local irritation begets only local motor activity,* in order to arouse peristalsis extending throughout the entire length of the tube, the chemical irritant, upon which we are depending to stimulate such function, *must be distributed throughout the entire length of the tube.*

When the motor centers are profoundly lethargic, resulting in entire suspension of peristalsis, *this is a physical impossibility* except by the tedious and difficult process above described.

MECHANICAL STIMULATION.

Massage of the bowel is another indirect means of stimulating the motor activity of the intestinal tube, but, since in practising massage the hands of the operator are free to move at will, a large portion of the surface of the tube may be stimulated simultaneously, thus sending sensory impressions from almost the entire length of the tube.

These impressions are responded to by motor impulses transmitted to a correspondingly extensive area of surface.

While this is a reflex phenomenon, these responses are transmitted in such numbers and to such an extent of surface that they throw the entire tube into a fair degree of motor activity, resembling, to a considerable extent, peristaltic waves generated by the centers when acting normally.

In describing reflexes the older physiologists had in mind only reflex movements, but at the present time physiologists are agreed that the reflex act affects not only the muscles, voluntary, involuntary, and cardiac, but also the glands. We have, therefore, to deal with the reflex secretion as well as reflex motion.

It should be borne in mind that by massage of an organ supplied with secretory nerves the impressions made on their efferent branches are converted into secretory impulses, and these are transmitted to the organ from which the irritation came along with such motor impulses as may be excited by the massage.

Secretion and motion thus excited are distributed throughout the entire length of the intestinal canal, no part of the tube being overstimulated while other parts are unreached.

Massage, either by the hand of a masseur or by an electric vibrator, is a therapeutic measure which can hardly be overestimated. It can be used with the most happy results in connection with other measures.

Another form of massage, much less positive, but none the less valuable as a health measure, is deep breathing, forced abdominal respiration. One who would preserve his health and keep himself in the best working trim will find this an invaluable aid if faithfully practised.

The best results are obtained by devoting ten to fifteen minutes to the practice of this exercise immediately after retiring at night. It should be carried out as follows:—

Lie on the back, with limbs straight, or on side, with knees drawn up; then by voluntary efforts fill the lungs to their utmost capacity, until the abdominal muscles are forcibly distended. Hold this position about ten seconds; then expel the air from the lungs, at the same time *forcibly contracting the abdominal muscles.* Repeat this at each inspiration until ten or fifteen minutes have been devoted to the exercise.

This alternate forcible distention and contraction of the abdominal walls changes the relation of all parts of the intestinal canal to each other, thus distributing and mixing the bowel contents. This mixing of the intestinal contents promotes the normal chemical changes, and these new compounds (nature's stimulant) induce, reflexly, both secretion and motion, and the result is more complete evacuation of the waste products.

The mental concentration incident to the successful carrying out of this exercise exerts a most favorable influence upon the function we are seeking to promote. Forced abdominal respiration is a voluntary act, and, in order to carry it on successfully, the attention must be concentrated upon it to the exclusion of all other things.

Mental states greatly influence vital functions. Anxiety, fear, grief, excessive mental activity, impair digestion, secretion, and excretion.

Conversely, concentration of the mental faculties in an effort to promote bowel movement, even for so short a time as fifteen minutes, *involves the cessation of damaging mental states.* The surcease thus afforded, the relaxation and response accompanying it, give a lethargic function a chance to become active.

In many instances the mental concentration incident to the practice of massage by forced abdominal respiration proves to be hypnotic to such a degree that, before the fifteen minutes' exercise has been completed, the subject is asleep, the subconscious mind simply having taken control while the conscious mind was intently concentrated upon the promotion of a vital function. The next morning a more satisfactory bowel movement occurs. Is not such a result worth while?

ELECTRICAL STIMULATION.

The motor centers can be stimulated to functional activity by electricity. While this is theoretically true, the author does not believe that electrical stimulation can be used to much advantage.

DIRECT PHYSIOLOGICAL STIMULATION.

In health, when the nerve-centers are acting normally, motor impulses are *generated and rhythmically transmitted* to the abdominal viscera. This is manifested in the intestinal tube by waves of peristalsis setting in at the pylorus and extending throughout the entire length of the small intestine. These waves amount to a worm-like motion by which every part of the structure of the tube is changed in its relation to other parts.

The uniformity and strength of these motor waves depend upon the *state of activity of the nerve-centers.* If these centers become lethargic, these waves are less distinct; if they are profoundly blunted, they cease altogether. In disease they are frequently in this inactive state; in narcotic addiction they are habitually so.

We have considered three of the methods by which this inactivity may be overcome, but the fourth, which is by far the most valuable and efficient, is now to be considered.

The functional activity of the intestinal tube depends upon the nerve-centers. If these centers are inactive, the motor activity of the intestinal tube, and the secretory activity of the glands emptying their products into it, are correspondingly impaired or suspended.

In attempting to remedy such a disordered condition, our first effort should be to restore as far as possible these centers *to a state of responsiveness.* If they have become exhausted from overexcitation, then sedatives, motor depressants should be given; if the suspension of their activity is due to the sedative effect of some morbid poison, then remedies which will directly stimulate the motor centers should be given.

It should be constantly borne in mind that to secure evacuation from the bowel it is equally as necessary to stimulate activity of the motor function of the tube as the secretory function of the glands.

The bile is probably the normal stimulant of the intestinal motion, and most substances used as cathartics doubtless act in the same way. These substances irritate the terminal filament of the sensory nerves distributed to the intestinal mucosa. This irritation is transmitted to the centers, and there motor impulses are generated and reflected to the point from which the irritation comes, and in this way that part of the intestinal tube is set in motion.

If complete paralysis exists, of course, no amount of irritation will excite motion. Where paralysis is only partial, or where the centers are benumbed by disease, or have their sensibilities reduced by powerful sedatives, a higher degree of irritation is necessary to induce peristalsis.

Agents which excite peristalsis by irritation of terminal nerve filaments are frequently incapable of exciting

such action *unless these centers are brought into a state of responsiveness by direct stimulation.*

The intestinal fluid may be an irritant to all parts of the mucous membrane which it reaches, but, as the tube lies in numerous folds, if motor activity is impaired its passage downward is much delayed. Until it has been distributed downward to a considerable extent, enough of the surface is not irritated to cause peristalsis throughout the entire length of the tube.

In the author's experience there are few conditions which make it best to do indirectly what can be done directly. It seems unreasonable to depend upon so inefficient and uncontrollable an agency as reflex irritation to induce peristalsis when it can be excited to any degree desired, and at the time it is needed, by stimulation of the motor centers with strychnine.

Physiologists teach us that waves of peristalsis set in at the pylorus and extend down the entire length of the tube. This is doubtless true in health, since *these waves originate because of the normal activity of the motor centers* and are transmitted throughout the entire length of the tube, but when the biochemism of the motor cells is interfered with by toxins these normal waves cease or are much less pronounced.

In this condition, if it is sought to excite peristalsis by introducing irritating substances into the intestinal canal, that part of the canal to which the irritant is applied will be first thrown into action. The contraction of the tube thus induced urges the irritant downward with greater or less speed.

But as these substances make their impressions upon each section of the tube only as they reach it, and as the motor impulses called out by this irritant are reflected only to that part of the tube from which the irritation

came, *the tube is not* thrown into motion as a whole or at once, but section by section, and only as each section receives motor impulses transmitted to it in response to impressions made by the irritant upon the nerves of that particular section.

Strychnine is an excitomotor stimulant and has an elective action for the involuntary or unstriped muscular fiber, and, as the muscular coat of the intestine is composed of this class of fibers, the entire length of the intestinal tube can be thrown into motion by direct stimulation of the motor centers by this drug, without materially affecting the voluntary muscles.

Peristalsis induced in this way corresponds exactly with that of health—that is, it occurs because of the artificially induced *activity of all the cells in the motor centers* controlling this function, and motor impulses generated in response to this artificial stimulus are transmitted in a uniform degree *to all the structures that would receive them if the centers were acting normally.*

The quantity of strychnine required and the frequency of administration depend mainly upon the degree of lethargy or insensibility of the nerve-centers, but when strychnine is administered in sufficient quantities and at proper intervals active peristalsis can be excited and kept up as long as desired, provided the nerve-centers are in condition to respond to any kind of stimulation.

If strychnine be administered with mercurial or other secretory stimulant, *each does its part of the necessary work* in bringing about the conditions essential for normal evacuation of the bowel.

The intestinal canal throughout its entire length is thrown into normal or hypernormal motion by stimulation of the motor centers by strychnine.

By increasing the irritability of the motor centers, this agent brings those centers into such a state of sensi-

tiveness that they readily respond to any peripheral irritation reflected to them. In this way reflex stimulation is made to more effectively augment direct stimulation.

As soon as the secretion-producing agent begins to pour its product into the intestinal canal, this secretion and other intestinal contents are gently, gradually, but certainly carried downward, thus bringing the chemical irritant into contact with more extended surface of the intestinal mucosa.

There occurs no overdistention of the bowel at any point, no retrostalsis, vomiting, colic, or other distress. In other words, *the conditions essential to normal evacuation of the bowel* have been in reality artificially induced, and *no more distress or other discomfort accompanies the act* than if no artificial means had been used in its induction.

This action is primary, direct, and sustained. Increase of peristalsis is one of the early effects of strychnine. This may be noticed within thirty minutes from the time of giving full hypodermic dose, this evidently being due to its direct stimulation of the motor centers.

This effect of strychnine probably persists longer than any other, or possibly it would be more correct to say that intestinal motion excited by the strychnine continues after the other effect of the strychnine has completely subsided. This is due to the fact that the active peristalsis excited by the strychnine results in a more perfect mixing of the intestinal contents. The chemical changes incident to this augment the effect of the strychnine by increased reflex stimulation, and this persists after the stimulating effect of the strychnine has ceased.

In this connection the author wishes to call attention to the action of the remedies of the belladonna group,

which in this particular are synergistic to strychnine. Strychnine increases the motor activity of the intestinal canal by its action as an excitomotor stimulant.

Atropine, scopolamine, hyoscyamine, daturine, in fact all of the remedies of the belladonna group, excite both secretion and intestinal motion, but the manner in which they do this seems not to be well understood; at least, it is not clearly taught in therapeutic works.

The author is never satisfied to use any drug empirically; if he cannot arrive, at least, at a plausible theory as to its mode of action he cannot use the remedy to advantage.

In considering the action of the belladonna group of remedies the following view of their action seems more satisfactory than any other and he believes it is in accord with established physiological law.

It is an established principle that there can be no cause without effect. When an effect is demonstrated its antecedent cause is assumed. There is no action without a reaction; therefore, no reaction without a preceding action.

In applying these principles of reasoning to the belladonna group of remedies we find that in their primary action they inhibit vasoconstriction, thus becoming vasodilators. This inhibitory action extends to the circular muscles of the intestines, as well as to the circular fibers of the arterioles and capillaries, and doubtless to the circular fibers of the duct of the lymphatic system.

This inhibitory action on the circular fibers of the intestine overcomes irregular spasmodic action in that organ and thus aids in preventing griping from the effects of the secretory stimulants. This occurs during the time the primary effects of the remedy are active.

The same inhibitory action extending to the circular fibers of the arterioles and capillaries allows them to

dilate, thus rendering the peripheral circulation more active. The peripheral surface of the body is the sensitive, the perceptive, area. Increased circulation in any part increases its sensitiveness. The friction of the blood or other excitant effects of the increased circulation in the surface of the body stimulate the sensory nerves leading from that surface.

This stimulation is taken heed of by the sensory terminal filaments and this expression of activity is transmitted to the motor centers, and, being received by these centers, is responded to in sensory, motor, and secretory impulses. This impression, slight as it may be from any given part, coming as it does from the entire peripheral area, amounts, in the aggregate, to a positive stimulation of the nerve-centers.

In other words, the slight impressions arising from such an extensive area, converging as they do upon the cerebrospinal centers, make a distinct, potent impression on these centers, and this is responded to by the production and transmission, to all the structures governed by such centers, of sensory, secretory, or motor impulses according to the nature of the center receiving such peripheral impression.

Thus do the entire group of belladonna remedies, notwithstanding they are motor inhibitory in their primary action, become, secondarily, exciters, both of secretion and intestinal motion.

This makes them invaluable adjuncts, if not essential ingredients, of all purgative compounds. After having, by their primary effects, controlled spasms and prevented griping from the effects of the secretory stimulant, they, at a later and opportune time, supplement the effects of such agents by the augmentation of both secretion and intestinal motion.

This action is made more effective if strychnine has been given in combination with the other ingredients of the purgative course. Excitation of the nerve-centers by strychnine brings them into a hypersensitive state, and makes them more responsive to the reflex stimulation excited by the secondary action of the remedies of the belladonna group.

A physiologically balanced purgative compound is one in which each ingredient of the compound augments and supplements the action of the other, and the whole, working in complete harmony, excites every function concerned in the evacuation of waste by the bowel proportionately, but effectively.

The conjoint effects of such a combination insure the evacuation of the bowel with the same ease and freedom from distress as if action was voluntary and not artificially induced.

Again, this proportionate, simultaneous stimulation of all the functions concerned in the bowel movement affects the discharge of the waste without undue depletion. Whereas, if chemical irritants or secretory stimulants alone are depended upon, if pushed to such a degree as to fully carry off the accumulated waste, when they do begin to act, they act excessively and unnecessarily deplete the patient.

It is important, as a general rule, that undue depletion from the action of purgatives be avoided. It is especially so in the treatment of drug addictions, as they are always anemic.

A physiologically balanced purgative compound, such as is herein outlined, may be depended upon to act effectively on narcotic habitués; but purgative compounds which do not contain strychnine and atropine or other belladonna principle in sufficient quantity to stimulate

active peristalsis are not only disappointing in their action, but cause great distress.

Strychnine and atropine given together act synergistically, and a more satisfactory degree of peristalsis can be excited by the two remedies combined than by either alone. For this purpose they are ideal agents.

The following schematic diagram is suggested as showing the principles upon which a physiologically balanced purgative compound can be made.

A combination of a suitable quantity of a remedy of *each of the four classes here named stimulates every function concerned in normal evacuation of the bowel and brings about that result with the least disturbance to the system and with the least possible tax upon its resources.*

Secretory stimulant.. (May be any one of these alone or two or more combined.)	Calomel. Podophyllin. Cascara. Rhubarb. Senna. Leptandrin. Aloin. Bryonia. Jalap or other such remedy.	(Castor oil, salines?)
Motor excitant	Strychnine.	
Antispasmodic	Ipecac.	Also secretory stimulant.
Vasodilator	Atropine. Hyoscine. Hyoscyamine. Scopolamine. Daturine.	Also antispasmodic and, secondarily, secretory stimulant.

A purgative should never be given on a full stomach. If the demand for its effect is so urgent that there is not time to wait until the stomach empties itself, then an emetic should be given.

Beginning with an empty stomach removes one of the causes of nausea, vomiting, colic, etc., and does much to overcome the objections to the use of purgatives.

The remedy administered acts as a purgative because its chemical or physical properties are such as to render it unfit for use as an article of nourishment. These chemical or physical properties render it unacceptable or repulsive to the system—an irritant. Because of those irritating or unwholesome properties, the "sentinels on guard" set up an active effort to eliminate it or its products.

The admixture of such an agent with the stomach contents renders the entire mass unacceptable for assimilation; therefore, it must either be ejected by vomiting or be passed through the intestinal canal as waste, being rendered unfit for assimilation.

Such a bulk of matter in the stomach interferes materially with the prompt and complete absorption of the remedies given, thus delaying, or rendering uncertain, their action. It is either voided from the stomach *en masse* or passed precipitately into the small intestine, where it greatly encumbers that organ and causes unnecessary suffering.

The passage of incompletely digested matter through the intestines with the numerous chemical changes incident to its admixture with the other intestinal contents, together with the irritation caused by the incompletely digested matter itself, is a principal factor in the causation of colic, griping, etc., as well as the reflex nausea and vomiting which so often precede or accompany the

action of purgatives. This distress is avoidable and should be avoided.

Few physicians give even a moment's thought as to the contents of a patient's stomach at the time the administration of a purgative is begun. The patient may have just partaken of a hearty meal, or if not, if the purgative is given in divided doses through a period of several hours, he is almost certain to "fill up" while he is taking the purgative.

Food taken at such a time is not completely digested, and the disturbances of the gastrointestinal canal produced by the purgative cause it to be either vomited or pass downward from the stomach before fully prepared for assimilation, and in either case unnecessary distress occurs.

Since the exercise of a little precaution, a little forethought, on the part of the physician will prevent these unpleasant effects, this certainly should not be allowed to develop. The administration of a purgative should not be begun when there is food in the stomach. None should be taken while the purgative is being administered, and the fast should be continued until the purgative action has ceased.

The first meal after the purgative should also be a very light one. After the action of a purgative, even after all discharges from it have ceased, the digestive tract is more or less enervated and disturbed; therefore, it is not in condition to undertake the digestion of a full meal. If a full meal be taken at such a time, it will greatly lessen the good effects which would otherwise have come from the action of the purgative.

In the opinion of the author, it is a serious error to administer an active secretory stimulant without at the same time making efficient provision for stimulation of

the motor function of the intestinal canal. Except in a few rare conditions *motor activity is always as greatly impaired as the secretory function.* Since each of these is essential to satisfactory bowel movements, the efficient stimulation of each should be provided for in every purgative compound.

It is the generally accepted view that all purgatives act in one of three ways. That is, by osmosis, by reflex stimulation, or by direct stimulation of the motor and secretory centers.

The osmotic theory of the action of the saline cathartics has been accepted for many years, but recently doubt has been thrown upon the correctness of that view of their action.

Some years ago the author's clinical experience led him to the conclusion that the saline cathartics did not traverse the entire intestinal tube.

According to the osmotic theory, this concentrated alkaline solution remained in the intestinal tube, and because of its affinity for water, and because of the action of laws of osmosis, fluids were attracted from the surrounding tissues and thus the flooding liquid stools induced by this class of cathartics were induced. If this view of their action is correct, the salines do not pass into the circulation at all, but remain in the intestinal tube and by their chemical action attract fluids.

This view of their action was accepted by the author up to the time he began to treat narcotic habitués, but in these cases their action was so disappointing that he was forced to reach the conclusion that the intestinal tube could not be fully emptied by the saline cathartics.

This conclusion was reached from the following state of facts: Patient was admitted constipated, but was given free colonic flushing, removing everything from

the colon that could be reached by an enema, the same being used in the knee-chest position. Then, Epsom salt was administered in full doses and repeated until from four to six free evacuations occurred.

It would appear that the flushing actions of this saline, preceded by the colonic flushing, would have fully emptied the intestinal canal. It seems certain that it would have done so had the salts and the fluid attracted to the intestine passed through the entire length of the intestinal tube; but as a result of the administration on the same day of a physiologically balanced purgative compound containing sufficient strychnine to excite free peristalsis, the patient passed a considerable quantity of semisolid matter.

Now, the author does not believe that this semisolid matter could have remained in any portion of the intestinal tube through which these free watery discharges passed. Therefore, he was compelled to conclude from repeated experiences such as this that the saline cathartic was absorbed from the stomach and upper part of the small intestine and was excreted by the colon, most likely by the transverse and descending colon, *thus going around rather than through the small intestine.*

The author cannot say that this theory as to the action of the saline cathartics is the correct one; however, recently some confirmatory evidence has been secured:—

"Arthur F. Hertz, Ass't Physician Guy's Hospital (*Guy's Hosp. Rep.*, vol. lxiii), has shown, by administering bismuth preparations at various periods of digestion and taking X-ray pictures of the abdomen at different periods of digestion, that salines are really absorbed from the stomach and upper bowel and probably excreted into the lower intestine. Hertz, in co-operation with F. Cook and E. G. Schlesinger, has shown that when food is taken

into the stomach it reached the cecum in about four hours. A saline aperient, on the other hand, may cause an action of the bowels in some instances in even half an hour, and often within two hours.

"Insoluble bismuth being administered with a meal will show, by radiographs, the exact length of time in which food passes down through the different parts of the intestine. A Seidlitz powder or its equivalent taken at the time of the bismuth or with the bismuth and food and then radiographs taken show that the movement of the bowel comes long before the bismuth and food reach the colon. The excess of water excreted, therefore, with such movements cannot come from the small intestine, as otherwise it would wash the meal and the bismuth down with it, but really must be excreted into the lower bowel. Saline purgatives also seem to cause no increased acceleration of passage of the food from the stomach to the cecum.

These investigations seem to show clinically that, when it is desired to empty the colon and not act on the small intestine, salines are indicated, but that, when it is desired to cause stimulation of excretion or of increased peristalsis or for drainage of the upper bowel, other cathartics than salines are indicated." (*Jour. Amer. Med. Assoc.*)

The conclusion is inevitable, it seems, from Hertz's experiments that the saline given with the meal was absorbed from the stomach, thus leaving the meal to pursue its own course undisturbed through the bowel, its passage not being hastened by the salines. Might it not have been that the salts getting into the blood rendered the blood excessively alkaline? This excessive alkalinity not being acceptable to the nerve-centers, an active effort for its elimination was excited, and, since

the colon happened to be the organ through which it was thrown off, free, watery bowel movements resulted.

The recent work of Cannon and Starling and Bliss by which they have demonstrated the function and motility of the ascending colon leads the author to suggest that if the salines do go into the blood they are most likely excreted by the transverse and descending colon, and not by the ascending colon.

It has been shown by these gentlemen that the functional activity of the ascending colon very greatly resembles that of the stomach. It is from this organ that the residue of nutritive matter not absorbed higher up is taken up by the absorbing villi.

The reverse peristaltic waves which begin at the splenic flexure of the colon and travel backward to the cecum serve to macerate and mix the contents of this part of the intestine, and to force back the more movable, the liquid, parts toward the ileocecal valves, thus preventing the too rapid passage of the contents of this part of the bowel to the transverse and descending colon, and giving more time for the absorption of nutrient material from it.

Cannon has shown that these reverse waves of contraction are not true peristaltic waves, that is, they are not preceded by a zone of inhibition, but are mere contractions of the circular muscles, and that these travel from the splenic flexure of the colon to the cecum in waves at the rate of about twenty waves per minute.

These contractions of the bowel, running in a reverse direction to the normal peristaltic wave, urge backward toward the iliocecal valve the more liquid contents of the bowel and bring these substances into intimate contact with the intestinal villi, which are absorbing structures. It is here that the fluid portions of the residue

of the products of digestion are absorbed and the more solid portions are formed into a cone in the center of this part of the intestine. This cone lengthens, little by little, by the concentric action of the circular muscular fibers upon it, and as this cone lengthens it projects into the transverse colon, where it is swept off by a normal peristaltic wave, running in the usual direction, and is transferred to the descending colon and rectum.

Now, since it is true, as they have shown, that the ascending colon is an organ from which the nutritious material is taken up, it is not likely that nature would contaminate such a pabulum by pouring into it an unwholesome excretion of any kind. Therefore, the author does not believe that the ascending colon is an excreting organ at all, but is rather a macerating reservoir from which nutritive material is absorbed.

Many physicians treating narcotic drug addiction depend entirely upon saline cathartics to empty the patient's intestinal tube. These cathartics do not do this work in such a manner as to give satisfactory results. They allow to remain in the intestine considerable quantities of toxic matter, the presence of which accounts for the nervousness, the nausea, and many other distressing symptoms from which patients of this kind suffer when the salines alone are depended upon for elimination.

Many surgeons also depend upon the salines to empty the intestine prior to operations. The author is sure that no such good results can be obtained from the salines alone as can be obtained from the administration of the vegetable and mercurial cathartics when combined with strychnine and atropine.

While the saline cathartic occupies a place, in fact fills a place, that no other cathartic fills equally well, still we should discriminate in our use of purgatives. When

the action of a saline cathartic is needed because of its depleting effect, then it should be given, but this class of agents does not unload the entire primæ viæ, and should not be depended on for that purpose.

The following are examples of physiologically balanced purgative compounds:—

℞ Hyd. chlor. mit.,
Powd. ext. cascara .....āā gr. x.
Powd. ipecac ..... gr. j.
Strychnine nit. ..... gr. ⅛ to ⅙.
Atropine sulphate ..... gr. 1/50.

M. et ft. caps. no. 4. Sig.: One every two hours, preferably at 4, 6, 8, and 10 P.M. Fasting.

℞ Hyd. submur. ..... gr. v.
Podophyllin ..... gr. j.
Powd. ext. cascara ..... gr. x.
Powd. ipecac ..... gr. j.
Strychnine nit. ..... gr. ⅛ to ⅙.
Atropine sulphate ..... gr. 1/50.

M. et ft. caps. no. 4. Sig.: One every two hours, on empty stomach.

For Aged Person When Mercury is Objectionable.

℞ Podophyllin ..... gr. j.
Aloin ..... gr. ij.
Powd. ext. cascara ..... gr. x.
Ipecac ..... gr. j.
Strychnine nit. ..... gr. ⅛ to ⅙.
Atropine sulphate ..... gr. 1/50.

M. et ft. caps. no. 4. Sig.: One every two hours, on empty stomach.

℞ Powd. ext rhei,
Powd. ext. senna .....āā gr. x.
Podophyllin ..... gr. ss.
Ipecac ..... gr. j.
Strychnine nit. ..... gr. ⅛ to ⅙.
Atropine sulphate ..... gr. 1/150.

M. et ft. caps. no. 4. Sig.: One every two hours, on empty stomach.

If patient is addicted to the habitual use of a narcotic drug, the strychnine in any of the above formulas should be increased from 50 to 100 per cent.

℞ Aloin ..... gr. ss.
Strychnine ..... gr. 1/60.
Ext. belladonna ..... gr. ⅛.
Ipecac ..... gr. 1/16.

Make one pill.

The above is the lapactic pill formula and is one of the most valuable ever written, but it is more strictly an evacuant than a purgative. It is one of the few formulæ in popular use which measures up to the standard to which, the author contends, all purgative compounds should be made to conform.

CHAPTER VIII.

TREATMENT (CONTINUED).

REMEDIES EMPLOYED.

HYOSCINE, SCOPOLAMINE, DATURINE, ETC.

SECOND only to the usefulness of purgatives in the treatment of narcotic addiction is hyoscine, scopolamine, daturine, or some other member of the solanaceous group of remedies.

Hyoscine, made from hyoscyamus, is considered by many to be the most uniformly satisfactory member of this group, but the difficulty in obtaining real hyoscine during the last several years has been very great and practically all orders for hyoscine have been filled from the stock of scopolamine, with which it is claimed to be chemically and physiologically identical.

As to its chemical identity the author cannot say, but, as to the physiological effects of hyoscine made from hyoscyamus and scopolamine made from the other members of the solanaceous group, the author is able to say that they are to all intents and purposes identical, but the effects of these two members of the group differ in some essential points from the effects of atropine and daturine. It is to points of difference rather than to their physiological effects in general that the author wishes to direct attention.

The physiological effects of these remedies are well understood, in a general way, and are sufficiently dwelt upon by writers on therapeutics. But in the matter of comparing their effects, one with another, when used in the treatment of narcotic addiction, the author's exten-

sive experience with these remedies in the treatment of this class of ailments has afforded him an opportunity to draw conclusions which writers on therapeutics have not had.

The effects of this class of remedies on the heart action are tonic and supportive: "In some subjects a decided slowing of the heart takes place immediately after the administration of a considerable dose of any one of these remedies, and in all, most probably, an instantaneous retardation of the pulse rate, but a very decided rise in the number of pulsations, quickly follows. Not only is the number of heart beats increased, but their vigor also and the area over which pulsations are distributed are enlarged.

"It has been conclusively shown that the increased action of the heart is due, first, to stimulation of the cardiac ganglia of the sympathetic and, secondarily, to a paralyzing action on the pneumogastric terminal filaments. In other words, the motor power of the heart is increased in activity and the inhibiting control is lessened."

"The more rapid action of the heart, increased respiratory movements, the contraction of the arterioles result in an increased supply of blood to the periphery, more rapid nutritive changes, and consequent elevation of the temperature. The rise in temperature in man from a full medicinal dose is from ½° to 1° F. This increased body heat is not long maintained; with the fall of blood-pressure (vasoparesis) there ensues a diminution in the temperature.

"They are all distinctly respiratory stimulants, both the number and depth of the respiratory movements being increased by them, but this increase is not in the same ratio as the elevation of the pulse beat, the pulse rate being also reduced in frequency, but the volume is sustained."

Hyoscine and scopolamine are decidedly more hypnotic in their effects than the other members of this group. In the matter of duration of effects, daturine seems to differ from the others to a considerable degree. It is somewhat slower in action than hyoscine, but when the patient is fully impressed by its effects this effect continues, holding practically a uniform degree, about twice as long as do the effects of hyoscine.

When a patient is brought to a certain degree under the effects of hyoscine it will, as a rule, be necessary to administer hyoscine about every three hours to maintain the same degree of effect, whereas if daturine is employed instead of hyoscine it is not, ordinarily, necessary to repeat it oftener than once in six hours to maintain the same degree of effect.

Daturine does not dry the mucous membrane of the mouth or throat so greatly as do the other remedies of this class; neither are the mental symptoms induced by it so active. The patient lies in bed in an inactive, somewhat dazed condition, his mind clear enough to make intelligent answers to questions, but if left to himself he has nothing to say, but passes the time in a dreamy semisleep.

This is a most satisfactory condition in which to keep the patient for the forty-eight or more hours following the withdrawal of the drug, but drug patients cannot be brought and kept in this condition of dreamy semisleep unless the system has been thoroughly cleansed of toxic matter before the opiate is withdrawn.

If the administration of any of these agents is begun while the system is still toxic, their effects will be most disagreeable and, in order to relieve the patient's suffering, will have to be administered so freely as to establish an active delirium. This is very unpleasant, both to the

patient and the attendant, and should be scrupulously avoided.

In former chapters enough has been said as to the effect of hyoscine in the treatment of drug addiction to show that it occupies an important place, but there is one phase of its curative value which has not been fully shown.

We have seen that in the treatment of drug addiction we are dealing with a toxemia, a drug, auto-, and intestinal toxemia. All the nerve-centers, in fact the entire nervous system, have been persistently restrained by the effects of the opiate. This has permitted all the structures of the body, even the cells themselves, to become saturated with toxic matter.

A generally inactive state, a semiparalysis of all the eliminating organs, has become, habitually, the bodily state. By the free administration of purgatives the bulk of this poisonous matter can be evacuated, but it is evident that the deeper seated, more lethargic tissues—the ultimate cells—cannot at once be made to throw off all the accumulated toxic matter. A perceptible and damaging residue will be left in them, no matter how thoroughly the elimination by purgatives has been carried out.

Now, the withdrawal of the opiate and the administration of hyoscine establish a state of general hyperesthesia during the continuation of which all the nerve-centers are unusually active. The increased activity of the nerve-centers gives rise to greatly increased motor and secretory impulses, which are transmitted to all the structures. This is especially helpful in bringing the deeper seated, more lethargic structures to throw off any residue of toxic matter remaining in them.

Therefore, hyoscine or other remedy of this group is in this additional sense a helpful factor in the successful

treatment of narcotic disease. *Patients to whom it has been properly and discreetly given reach a normal condition in much less time than do those who have not taken it.*

It is true that there would be a general awakening of the nerve-centers following the withdrawal of opiates, which would, finally, lead to the throwing off of the remainder of toxic matter, but hyoscine brings this about much more effectively and more promptly than the unaided restorative forces of nature.

The most pleasing feature of this hyperactivity of the nerve-centers is shown in the patient's mental condition. The gloomy, despondent condition which has been so constant gives way to one of vivacity and brightness. So distinctly is this the case that the patient himself will notice it and remark about it. This is a very pleasing and encouraging feature and one in which most patients take a very keen interest.

For one whose mind has been so lethargic that he could with difficulty recall the most commonplace experience of his life to wake up with a revivified memory of all these events, and to be able to recall them with promptness and accuracy, is a most delightful experience. Especially is this true with the more highly educated and ambitious patients.

The author having been the first to direct the attention of the profession to hyoscine (scopolamine) as a remedy capable of relieving the suffering incident to the abrupt withdrawal of opiates and materially aiding in the cure of narcotic drug addiction, he has felt it his duty to stand sponsor, as it were, for the remedy.

In this capacity he has found it necessary to defend the remedy from the attacks of its enemies, as well as from its overzealous friends. And, now, after a period

of more than ten years he feels justified in saying that the overenthusiastic friends of the remedy have done more to disparage its use than those who were openly opposed to it. Their advocacy of hyoscine (scopolamine) as a specific cure of the morphine addiction has led to its ill-advised and extravagant use.

The effects of the remedy when given in excessive doses or when the patient has not been properly prepared for it are extremely unpleasant. This has created a prejudice against the remedy in the minds of those who have been unfortunate enough to have it tried upon them in this manner or under these conditions. This is to be regretted, since persons who have had such an experience with it are not likely now to seek the benefits they might derive from its proper use. This is unfortunate, because those who have been thus disappointed may continue in slavery under the belief that there is no relief for them.

While it is unquestionably true that there are many persons who can take hyoscine (scopolamine) in large doses for days at a time without danger to life, the author is equally certain that there are others who cannot do so, and, as no one is capable of judging beforehand which of these classes of patients he is undertaking to treat, one is not justified in giving excessive doses until the tolerance of the patient has been fully ascertained.

The most "liberal" use of hyoscine (scopolamine) which has been brought to the author's attention is reported by Rosenberger in *Medical News,* Nov., 1902.

This patient was a male 53 years of age taking 30 to 60 grains of morphine per day. Following the teachings of Lott, that hyoscine is a specific cure for the morphine addiction, Rosenberger kept up the adminis-

tration of hyoscine in this case fifteen days, during which time hyoscine equivalent to 188 $\frac{1}{100}$-grain doses was administered to this patient.

On the fourth, fifth, sixth, seventh, and a part of the eighth day $\frac{1}{100}$ grain of hyoscine was given, hypodermically, every hour. The doctor says that "during these days the patient was less restless, slept several hours of the time, and looked brighter. His skin became very hyperesthetic, and, if touched ever so lightly, severe muscular twitchings were produced. The respiration was from 12 to 18 per minute; pulse, 84 to 60. Bowels were evacuated twice during these five days. Urine on the fourth day was 29 ounces; fifth day 22 ounces; sixth day 12 ounces; seventh day 14 ounces; eighth day 27 ounces. The hyoscine during the latter part of the eighth day was reduced to $\frac{1}{100}$ grain every two hours. At this time a bright-red rash developed by the side of the spine, knees, legs, body, and face."

That a record of the extremely disagreeable symptoms which may be expected to follow this excessive use of hyoscine may be preserved, the following quotations from the doctor's paper are made:—

"During this time, that is, from the fourth to the eighth day, above quoted, his talk was unintelligible, partly on account of the dryness of the mouth and tongue. The latter organ felt as dry and hard as a splintered board.

"On the ninth day he voided 37 ounces of urine, and on the tenth day, 40 ounces; on the eleventh day, 54 ounces at one time and 26 ounces at another; on the twelfth day, 34 ounces; the thirteenth day, 43 ounces, 36 at one time and 7 at the second urination; fourteenth day no urine voided at all and no bowel movement; fifteenth day 53 ounces at one time, 10 ounces at another, and 7 ounces at the third.

"The patient was quiet, especially after each injection, and on the tenth day he begged for a hypodermic of morphine or pill of morphine. After a severe lecture he quieted down and never asked for the drug again. The pulse ranged between 62 and 84; respiration, 18 to 22 per minute.

"The patient now began to feel stronger and became able to help himself more. At times he still picked at the bed-clothes and was heard mumbling about money matters or some one stealing from him, and not until the eighth or ninth day was he able to identify anyone. If attempts were made to force him to drink he would spit the milk in the attendant's face without warning. The tongue still remained hard, though after several days' moistening with glycerin it gradually became soft and more moist.

"After the twelfth day the hyoscine, $\frac{1}{100}$ grain, was given every three hours, and strychnine nitrate four times a day. The hyoscine was stopped entirely on the fifteenth day. Up to this time he had taken $1\frac{22}{25}$ grains of hyoscine in fourteen days. Strychnine in the form of nitrate, $\frac{1}{30}$ grain four times a day, was the only medicine given from now on.

"The bowels had been evacuated once a day, sometimes once in two days. After the seventh day the bowels were evacuated two, three, or four times a day. The stools were liquid in character and attended by some pain. As this became persistent, suppositories of bismuth subgallate, 20 grains each, every three or four hours were given with beneficial results.

"Insomnia now bothered the patient. This was controlled by trional in doses of 20 grains in hot water. A dose of hyoscine, $\frac{1}{100}$ grain, was also given in conjunction with the trional.

"On the eighteenth day he insisted that it was impossible for him to get along without morphine, so we compromised by giving him $\frac{1}{5}$ grain of apomorphine hypodermically, with the satisfaction of seeing him much quieter and less obstreperous. No vomiting or even nausea was produced by this dose of apomorphine.

"Trional was now given twice daily with apomorphine, 1/10 grain. On account of the great restlessness and nervousness, the mixture containing sodium bromide, 20 grains, was given three times a day. From the eighteenth to the twenty-fifth day he gained strength daily and ate readily of pretty nearly everything, though in the first two weeks a liquid diet of milk and eggnog was prescribed for him. Convalescence was rapid and marred only by a slight diarrhea, seven or eight movements daily, which was readily controlled by the bismuth subgallate suppositories."

This case is quoted at this length because the author feels that some comment should be made upon it. One can hardly imagine a more distressing condition than that of the patient's mouth and tongue while under this remedy to this excessive degree. The statement that his "tongue was as dry and hard as a board" is enough to warn anyone against putting the patient into that state.

It is evident that during most of these days the patient was not able to take nourishment of any kind. This evidently allowed the physical strength to run down very greatly and, as the patient was still to be taxed by diarrhea in the latter part of the treatment, it does not occur to the author that the patient received any benefit from the administration of hyoscine.

Again, the author wishes to call attention to the condition of the bladder. The statement that the bladder was allowed to fill to such an extent as to contain as much as 50 or 58 ounces of urine at one time is alone enough to condemn this excessive use of hyoscine. The distention of the bladder to that degree is almost certain to be followed by a cystitis, a most distressing ailment, and one which would call strongly for a narcotic.

But even that danger might be risked if the excessive administration of hyoscine really cured the patient, but it

does not do so. In the author's opinion, this patient would have been infinitely better off had he been given an active purgative and the morphine discontinued at once without the administration of hyoscine. Then he could, in a few days' time, have fought out the battle with the majority of these complications and would doubtless have emerged from the ordeal with much more physical vigor and a much better chance to regain his footing than he had after this long seige of dosing, supposed to be a curative treatment. After this was all over he still had equally as hard a fight to make with the complications which followed the discontinuance of the drug as he would have had to make had none of this treatment been given.

The doctor thinks his patient was cured, but in the judgment of the author between the eighteenth and twenty-fifth day, when his rapid convalescence began, it is more than likely that the patient, by some means, secured an opiate, and it was the taking of this that restored his condition to such a degree that he could eat and begin convalescence.

In attempting to treat patients of this class at their homes, or in the wards of a general hospital, the physician never knows that the patient does not get drugs which he does not order for him. Sympathetic friends, or others with whom the patient can have contact, will frequently yield to his importunities and bring him something that will defeat the best efforts made in his behalf.

It is evident that this patient's system was about as toxic as it could have been consistent with the continuance of the functions of organic life. Any sudden improvement of the patient, the sudden cessation of the distressing symptoms, will warn one of experience that a drug has been secured from the outside and is being

taken, and that that accounts for the sudden cessation of the distressing symptoms and for the rapid improvement in the condition of the patient. While it is possible for such a change to be due to improvement in his physical condition, it is often quite the reverse from progress toward final freedom.

A physician in the West reports a patient taking 20 grains of morphine per day in which he gave 65 $\frac{1}{100}$-grain doses of hyoscine during the period of two and one-half days, being over $\frac{1}{100}$ grain every hour for that length of time. He says that the patient was discharged cured. In another case this physician notes that a patient using large quantities of morphine and cocaine daily was treated for three days and discharged cured.

When one reads such statements as these in the first-class medical journals it makes him wonder whether the days of miracles have really returned. In the writer's experience the cure of morphine addiction in a few days' time is like learning "German in ten lessons." Patients who are given such a course of treatment and discharged *cured* at the end of a few days' time find that they have about as much to contend with after their cure as before it, just as the would-be German scholar finds that after his ten lessons he has very much more to learn than he thought he had at the beginning.

It is evident that the word "cure" as used by these gentlemen does not mean what it is ordinarily understood to mean. There is much more involved in the cure of a case of morphinism than can be done in a few days' time with any course of treatment, however perfect it may be.

In addition to the drug intoxication of which the patient is suffering the system is surcharged with poison, both of intestinal and auto- origin. The functional

activity of all the excretory, secretory, and digestive organs is impaired; the blood-changes are marked, the red corpuscles are greatly diminished, and the white correspondingly increased. The patient is profoundly anemic; muscles flabby and relaxed; nervous system disordered; mental activity impaired; in fact, the patient is greatly below par in every respect.

In the treatment of this or any other disease it is still necessary to conform to the established physiological laws rather than to depend upon some miraculous agent to transform our patients from disease to health. These markedly deranged conditions cannot be corrected in a few days' time to such a degree as to justify the patient being discharged *"cured."*

The administration of 65 $\frac{1}{100}$-grain doses of hyoscine in two and one-half days, a little over $\frac{1}{100}$ grain every hour, is excessive medication and would be dangerous in many cases. The author does not wish to be understood as condemning the use of hyoscine (scopolamine) in the treatment of these addictions, because it is a remedy of great value; but it has its limitations, as well as its use.

It does not cure the morphine addiction, as is claimed by some who advocate its use with the rashness of a new convert. But it does fill one of the most important indications in the treatment of such cases. If the withdrawal of the opiate were all that is involved in the cure of these addictions, hyoscine (scopolamine) might be regarded as a cure, but that is not all.

The physician deceives himself if he thinks that merely because the opiate has been withdrawn by the aid of hyoscine and the patient has reached the stage where the administration of either drug is not longer imperative that he is cured. He is still very weak and nervous; his

system is still in a toxic condition, not as much so as at the beginning, but still sufficiently so to cause an elevation of temperature of from 1° to 3°, attended by aching of the limbs and back, excessive nervous reflexes, and various other unpleasant symptoms, and unless he has had something more than hyoscine given him in the cure of his addiction he will soon have a diarrhea that will tax his endurance to the limit, if it does not force his return to the use of the opiate.

There are several institutions in this country which depend upon hyoscine to cure their patients. They make the most wonderful claims for the drug, or, rather, for their particular combination, which is, in fact, nothing more nor less than hyoscine or one of the drugs of that group. They regard the withdrawal of the opiate as all that is involved in the cure of these addictions and insist upon discharging their patients within eight days from the beginning of the treatment. In almost every instance such patients find that they have so many complications to contend with, and are so poorly prepared to make such a fight, that they soon give up in despair and return to the use of the opiate. Many cases with such a history have come under the author's care.

In the very best hands all that can be done for a patient of this class during the first week of treatment is to clear his system to a large extent from the retained excrementitious matter and thus remove the source of intestinal intoxication, partially cleanse the system from ptomaine and other poisons of auto-origin, withdraw the opiate, and bring the patient to a condition where its use is no longer a necessity. When this is done the patient is not cured, but he has only reached the point where convalescence may set in. Such a patient needs medical supervision, discipline, and moral support as

badly during the period of convalescence as he needed active treatment before that stage was reached.

Fortunately such patients convalesce rapidly. They eat heartily, digest and assimilate a large quantity of food, and take on strength rapidly. If a wise supervision is exercised over them and they are required to carry out a physiological course of physical training, so as to develop all the newly acquired flesh into stout muscular fiber and tone up what they already have, in many instances convalescence may be advanced to a wonderful degree in the first thirty days. In thirty to sixty days more, with proper training, such a patient should be practically normal.

When such a physical condition has been reached, with the corresponding improvement in the mental condition, and the patient has been off of his drug and all substitutes for it for a period of thirty to sixty days, he may be discharged as cured. The word "cure" with reference to these cases should not be used to mean less than that.

Some physicians who treat these cases by reduction insist upon a period of treatment and personal supervision of from six to twelve months. The author thinks such a protracted course of treatment is as much an extreme in the other direction as the few days' term is with those who have been above considered. In the cure of these addictions it is not only necessary to take the patient off of the drug and put him in good physical condition, but if he is to be permanently cured he must be made independent of all drugs.

During a long course of treatment, supervision, and at least partial restraint, the patient does not develop independence or self-reliance, but continues to depend upon his physician and upon the remedies he is taking.

His volition is restricted and his own will is not the controlling force from which his conduct springs. In fact, a protracted course of treatment, supervision, and restraint in patients of this class who are already slaves to a drug tends to perpetuate a condition of invalidism and dependence from which the patient seems powerless to extricate himself.

In the experience of the author, patients of this class who have been taken off of the drug by the proper method and have been developed into good physical condition as rapidly as it may be done are in safer condition to be thrown on their own resources by the end of the eighth to tenth week after the drug is withdrawn than they are if kept under treatment and restraint longer.

At this period, time has not materially obliterated the memory of their former abject slavery: they are supremely happy in the realization of their freedom and in contemplating the desirable things life may have in store for them, since they have another chance, another opportunity, to enter upon their acquisition. They are full of hope, buoyancy, and ambition. The world and all that is in it present to them a new and bright prospect. At this flood tide of hope they are in a better condition to be thrown on their own resources and to establish themselves securely in a safe relationship to all things that might tempt them than they are if kept under restriction until this tide has materially ebbed.

To those who are seeking the truth in this matter the author would say: "Do not accept the miraculous claims of the three-day-cure men on one hand; neither swing to the standard of those who insist upon the period of from six to twelve months' treatment and restraint." There is a middle ground, a reasonable position where the truth may be found. Remember that miracles are

not to be expected, and that restraint does not develop self-reliance, upon which the patient must finally depend and without which man is mere driftwood.

It will be interesting to consider some of the objections raised to the use of hyoscine by those who are opposed to it. During the first two years after the appearance of the author's first paper advocating the use of hyoscine in the treatment of drug addictions several articles appeared in medical literature, magnifying the dangers of the use of that remedy.

In the *Medical News* of Oct. 18, 1902, Crothers and Mattson each published a letter in which they condemned the use of hyoscine in the treatment of morphinism. Mattson denounced the drug in strong terms, but did not give specific data upon which his opinion was based. He seems to be so wedded to his idol, his sedation-substitution method, that he cannot look upon any other method with even the slightest degree of tolerance.

This is unfortunate, because one who has devoted the time to the study and treatment of these addictions that Mattson has, and who has the broad charity for these unfortunate victims that his writings show him to possess, should have a more successful treatment for them than the one he advocates. He still pursues the same method he has advocated for many years, and, while these have doubtless given good results in his hands, this has been largely because of his skill in administering it and his tact in managing this class of patient. The results obtained with the Mattson method in the hands of others have not been satisfactory, and, judging from the expressions of standard authors, the world is still without an acceptable treatment for morphinism, notwithstanding the fact that the Mattson method has been before the profession for a number of years

Crothers undertakes to give a specific statement of his experience with the use of hyoscine in a dozen or more cases, but he is extremely unhappy in that effort. He is quite non-specific. He says: "In each case delirium and hallucination and delusions of a mild type began after the second or third dose of the drug was given and continued for from two to four weeks."

Now, are we to understand that the administration of hyoscine was continued during these two to four weeks, or are we to understand that only two or three doses of hyoscine were given to each patient, and that the delirium, etc., induced by these doses continued from two to four weeks? If the former, then nothing unusual has happened, as no one familiar with the effects of hyoscine is surprised at one under its influence having mild delirium, hallucinations, etc.; but if the latter view is to be taken, that is, that as a result of the administration of two or three doses of hyoscine in each of a series of 12 cases a delirium, etc., was induced which lasted from two to four weeks, then the author must say that Crothers has recorded an experience that no other man has had, or is likely ever to have.

That the delusions and hallucinations, etc., should continue as long as the administration of hyoscine is continued, or at least until complete tolerance for that drug is acquired, everyone would expect, but that such symptoms should continue for from two to four weeks as a result of the administration of two or three doses of that drug is unreasonable. The effects of hyoscine are very little, if any, more lasting than those of other narcotics. The delusions, etc., from its use are of short duration.

In a series now numbering more than 3000 cases in which the author has used this remedy, only in two or

three cases has delirium or delusion of any kind been present as long as forty-eight hours after the last dose. Probably in 1 case out of 10 such symptoms continued twenty-four hours after the last dose, but in fully 90 per cent. of the cases the mind was perfectly clear by the twelfth hour or earlier, and remained so thereafter. In many cases the delirium subsides by the fourth or sixth hour after the last dose.

Crothers further says:—

"As a substitute for morphine, I believe it [hyoscine] to be more dangerous and uncertain than the bromide of sodium. From the use of both of these drugs delirium and dementia are almost certain to follow."

Again do we find him unhappy in his statements. If he means that delirium and dementia may follow the prolonged or habitual use of either of these drugs, then he is doubtless correct. But if he means that dementia is almost certain to follow or is at all likely to occur as the result of the proper therapeutic employment of either of these agents for the length of time such remedies are needed in the treatment of morphinism, then he is again wide of the mark.

Instead of causing dementia, each of these remedies has made a greater reputation in the treatment of insanity than any other two remedies in materia medica. There is no authentically reported case in which the proper remedial use of either hyoscine or the bromide has ever caused dementia or other lasting mental disorders.

In persons who have been taken off of morphine by the methods advocated by the author, that is, thorough elimination of all toxic and effete material as a primary step, then the control of the acute withdrawal symptoms

with hyoscine, the perfect recovery of all the mental faculties has been one of the most uniform and striking features. The physical equilibrium is regained at a wonderfully rapid rate, but the mental improvement is still more marked.

The perceptive and reasoning faculties are bright and unimpaired; the memory is completely restored. It is the universal testimony among patients treated by the author that they recall accurately any event with which they have been familiar.

Some time since, a patient of this class, a classical scholar, who had been using morphine in large quantities for fifteen years was discharged from treatment. He said that during most of the time he had used the drug he had hardly looked at a book and certainly had not thought of memorizing a quotation from one. The revival of his memory was so perfect and was such a delightful experience to him that he devoted much of his time to entertaining his fellow-patients with long recitations from Shakespeare and other classical writers which he had committed to memory in his schoolboy days thirty years before. He assured the author that during the time he used morphine he was never able to recall, connectedly, any of these selections, but after completing the treatment he had the ability to recall, with perfect accuracy, any selection he had thoroughly memorized or event with which he had been familiar.

Another patient having a similar experience, a lady who had used morphine five years. Within a few days after the completion of her treatment she sat down to a piano and reproduced from memory difficult pieces of music which she said she had not played, or even thought of, for several years.

In the experience of the author, instead of hyoscine being dangerous to the mind of the patient, it does more

to awaken and revivify the mental faculties than any other remedy with which the author is acquainted. It certainly does not deserve to be brushed aside as treacherous, unfit for use, and almost certain to be followed by dementia and death. Hyoscine cannot be considered a substitute for morphine, and there is no reason for seeking such a substitute.

Hyoscine is unfit for prolonged use, but with proper discretion and with proper doses it can be used as safely as any other narcotic. It is certainly not more dangerous than atropine, strychnine, cocaine, and other powerful agents in common use. To be safe it must be used with the same discretion and forethought that is necessary to make the use of these remedies safe.

Hyoscyamus (henbane) has been in common use for centuries. Its alkaloids, hyoscine and hyoscyamine, which are now more often used, do not produce any effect not common to the crude drugs. Yet in all these years no one else has recorded such results from their use as Crothers does.

It is well known that mild delirium and hallucination, both of sight and hearing, are the usual effects of full and repeated doses of hyoscine or any other of the belladonna series of remedies, and, as these delusions and hallucinations are the direct effects of these preparations, it is to be expected that they will continue as long as the drug is given. It is doubtless true that, if the patient be kept constantly under the influence of hyoscine, or any of this series of remedies, for a period long enough for the localized hyperemia of the brain which they induce to cause structural changes in the brain, then prolonged delirium, or even permanent dementia, may result.

But it is the universally recorded experience of physicians who have made extensive use of these remedies

that if the administration is continued for a limited period these mental symptoms subside in a short time after the drug is discontinued and no harm results; in fact, no after-effects whatever remain.

Certainly if such untoward effects as Crothers refers to ever followed the proper therapeutic employment of these drugs someone would have placed the fact on record before this time, but, as no such record can be found, it is the belief of the author that Crothers has overestimated the effects of hyoscine in his cases and underestimated the effects of the toxic matter in the system of the patient, as well as the effects of the sudden withdrawal of the opiate.

The prolonged use of morphine locks up in the patient's system such a quantity of excrementitious and toxic matter that the abrupt withdrawal of morphine without first removing such toxic matter will often be followed by delirium, hallucinations, and delusions, and even by permanent dementia, without the administration of hyoscine or any other drug. The doctor does not claim to have in any way prepared his patients for the withdrawal of the opiate, but simply to have discontinued morphine and begun the administration of hyoscine. Unsatisfactory results are to be expected from such a course of treatment, especially if the administration of hyoscine be continued for a considerable length of time, as it evidently was in these cases.

It can be readily demonstrated that the suffering, as well as the mental aberrations, incident to the withdrawal of morphine is due more to the effects of the toxic matter with which the system of the patient is surcharged than to the withdrawal of the opiate *per se*.

Upon the withdrawal of morphine from patients in this condition the nervous system wakes up to the pres-

ence of this irritating toxic matter and sets up an active effort to throw it out, and in this it goes to such an extent that it does violence to its own integrity.

The prominent feature of this activity is a rise of temperature of from 1° to 4°. This fever has very much the type of a "break-bone fever." One suffering from it feels as if every bone in his body will burst and that every nerve in his body is on the outside and is being lacerated by some torturing instrument, and in many other ways his sufferings are unbearable.

The administration of more morphine under these circumstances will allay this activity of the system, the temperature of the patient will fall, and his condition become one of comfort. The administration of hyoscine at this time does not reduce the fever, but at first rather increases it; therefore, in order to relieve the patient's discomfort, *very much larger doses of hyoscine must be given than would be required to bring relief were the fever not present. In fact, relief does not come from the effects of hyoscine under such circumstances until delirium ensues, and then the patient, being unconscious, does not suffer.*

On the other hand, if the system of the patient be cleansed of toxic matter before the morphine is withdrawn the fever and other violent reactionary symptoms do not occur to such a degree and the *quantity of hyoscine that is necessary to keep him in perfect comfort is so greatly reduced that he can be taken through the entire course of treatment, in many instances, without the occurrence of delirium.* In other cases in which slight delirium does occur it subsides within a few hours after the administration of hyoscine is discontinued, leaving no untoward after-effects.

Another influence which increases the tendency to delirium in cases when morphine is withdrawn without

proper preparatory treatment is engorgement of the portal system, which always exists in such cases. When the flow of the blood through the portal system is thus obstructed any arterial stimulant expends its main force upon the cerebral circulation, and, therefore, causes a much greater degree of cerebral blood-pressure than it would were the portal system free from obstruction and in a condition to receive its full quota of the blood-current. The quantity of hyoscine that would excite an active and prolonged delirium under such circumstances can be given to the patient after his system is prepared for it without the occurrence of delirium at all, but if delirium does occur it will be of transient duration.

In Crothers's cases the abrupt withdrawal of morphine without treatment of any kind would likely have been followed by an active delirium in a majority of the cases and probably in some by dementia. Therefore, in the opinion of the author, the untoward symptoms recorded by Crothers can be fully accounted for without attributing them to hyoscine, and the author feels that the doctor is unwarranted in attributing them to the proper remedial use of that remedy.

The attitude of the profession toward the victims of narcotic drugs is not at all commendable, or even reasonable. Little effort has been made by members of the regular profession to relieve them, and this has left them almost entirely to the hands of charlatans and nostrum venders, from whom satisfactory results in the treatment of any disease was not to be expected.

Until very recently the few reputable men who have endeavored to restore them to health have followed such faulty teachings that their results have been almost as disappointing as those of the irregulars.

Notwithstanding that it is well known that the withdrawal of the drug is always followed by suffering of the

most intense character, and even by dementia or death, men of high standing in the profession who write medical books and whose teachings are supposed to be worthy of credence still continue to speak of the morphine addiction as a mere appetite, a vice, a habit, and to maintain that the principal indication in the treatment is the withdrawal of the drug.

"The indulgence of morphine is a vice of recent years." (Osler's "Modern Medicine.")

"Morphinism is an irresistible craving for morphine." (Tyson's "Practice," ed. 1906.)

"When the disease is fully developed there exists an irresistible craving for the drug, and it is this artificial appetite that is the chief difficulty to be overcome in the treatment. It is the craving for unnatural stimulants that must be fought. If this craving is overcome all the rest is comparatively easy." ("American Textbook of Applied Therapeutics," Wilson.)

"The withdrawal of the poison is the main indication." (Gordon's "Diseases of the Nervous System," ed. 1908.)

"Mental and moral attributes are anesthetized by morphine and patient lies by choice." (Edward's "Practice of Med.")

"Morphinism—unconquerable longing for morphine." (Strumpell's "Practice of Med.")

These men, and many others who have assumed to speak on this subject, have evidently written of this condition at "long range" and merely continue to repeat the statements of some former writer who also drew his conclusions from other sources than actual clinical experience.

The man who is addicted to a narcotic drug is as truly a diseased man as one who has typhoid fever or

pneumonia. The necessity for therapeutic measures is as great and the indications for their employment are as positive in the one as in the other. Why these important measures are totally ignored by leading modern writers is beyond comprehension.

It is difficult to determine from a careful search of the literature who first advanced the views expressed by the authors above quoted. It is evident that such conclusions could not have been reached from personal study of the subject. In the opinion of the author those who have brought down to date and given the weight of their authority to teachings which they have not verified by actual clinical experience are especially blameworthy. No author is justified in merely parrot-like repetition, and thus lending the weight of his authority to the teachings of a former age. If he has verified them by his own clinical experience, then he is justified in repeating them and passing them on to be followed by his devotees.

But it is not believed that any practical experimentation toward the end of truth has been followed by these writers when speaking of drug addiction. If they were equally erroneous on other lines of teachings the profession would promptly discard their works altogether, but the fact that they do teach sound doctrine on so many subjects, and that they are followed with safety by the profession along these lines, gives them such influence that, when they do teach an error, it is fraught with the most far-reaching consequences.

The author is free to confess that before he cured his first case of drug addiction he found it necessary to entirely discard the teachings of the professions up to that time. Not one line was found in medical literature on this subject that contributed in any way to success in the treatment of such a case; in fact, when the teachings

of the authorities were followed they led away from rather than toward a cure. Therefore, disregarding all former teachings, he undertook an independent study of the subject, and he reached the conclusions recorded in this work solely from his own clinical experience.

The first practical statement of the real pathology of drug addiction, together with the first rational basis for its treatment founded upon the general principles of medicine, found its way into medical literature in the paper of the author of October, 1901. No intimation was found in medical literature prior to that time of the value or essential necessity of elimination as a preliminary step in the treatment, except a part of one paragraph in an article by Waugh. This was in effect that "calomel is beneficial in these cases." This article, however, had not been seen by the author until after the publication of his first paper; therefore, his conclusions, then announced, were based entirely upon his own clinical experience.

Among the accessories which contribute to success in the treatment of narcotic addiction, none has so much importance as a well-equipped institution in which the patient must reside during the period of treatment and convalescence. Control of the patient in every detail is essential to success. This must not be the control of coercion, but of confidence; the control a medical man exercises over his patients by reason of the unswerving confidence of that patient in him.

This must be based upon the fact that the physician himself is really in earnest in his efforts to cure the patient and has an abiding interest in the welfare of the patient. This relation of mutual trust and mutual confidence is absolutely essential to success. This mutual confidence cannot exist so long as either party holds the other to be untrustworthy.

Any physician who regards narcotic addiction as a mere vice, a perversion, and holds all addictees to be liars, fiends, perverts, degenerates, etc., is unfit to treat such a patient. The very fact of holding such opinions places a barrier between him and his patient that makes the establishment of confidential relations impossible.

The fact that the patient needs to place himself under the care and control of a physician, and that he will not for a time be able to be guided by his own volition in the matter of taking or not taking his drug, is not an impeachment of his moral character. He seeks the aid of a physician because he realizes his own inability to control himself with reference to this particular matter, and, unless the physician can credit him with honesty of purpose and with being worthy of confidence, at least on other matters, he should not undertake his case.

A resident physician, one who can be at hand at all hours, day or night, to administer to the needs of the patients, is essential, not that those needs will come so often, but when they do come they must be met promptly. These patients do not bear to be put off, and to have to wait until the physician can come from a distance to relieve them.

It must be remembered that their experience has led them to lose confidence in all remedies except the one remedy they have been taking, and now that that is to be given up they are skeptical as to the power of other remedies to relieve any acute distress which might overtake them. Under these circumstances the personal confidence they have in the physician is a wonderful help to them and with him present, if this confidence is mutual, he can with mild and harmless remedies relieve any distress which may come to them, and thus conduct them safely through their convalescence and do much to restore their confidence in such remedies.

In a well-equipped institution many measures are at hand which are of the greatest value in treatment of these cases. Hydropathy, electricity, massage, physical training, and other such measures should be used in the most liberal manner. Hydropathic treatment, especially, is of great value in the days following the withdrawal of the drug.

Nothing soothes the patient more completely and is more likely to contribute to his comfort and well-being than a neutral bath, especially if this be given at bed-time. This will often aid materially in securing a good night's rest and in restoring the nervous system of the patient. The vapor bath is valuable in some cases, but, as drug patients are usually anemic, they do not stand the vapor bath well.

A cold pack may often be used to advantage. Its antipyretic effect is usually sufficient to reduce the fever which is present for several days after the patient is taken off the drug. A half-hour or an hour's sweating in the pack relaxes the tension of the nervous system and is often followed by two or three hours of quiet, restful sleep, which refreshes the patient very much.

It is a mistake for any physician to attempt to treat narcotic drug patients at their homes or in the wards of a general hospital. Under such surroundings failure is more likely than success.

During the period of treatment and for ten days or two weeks thereafter, at least until considerable self-reliance has been acquired, the patient should be separated from his family, and from all others to whom he looks for sympathy. Sympathy and overattention tend to the development of hysterical symptoms that are troublesome and retard the acquirement of self-reliance which is so essential to success in these cases.

The presence of the physician under whose care the addiction was formed or who has attended the patient during any effort at treatment that has ended in failure also exerts a very unwholesome influence over the patient. Patients of this class have a fixed habit of dependence upon some extraneous influence, their drug, the sympathy of friends, etc., and have largely lost their individuality.

Therefore, a course of treatment to give the best results must be disciplinary, as well as therapeutic. It should not be undertaken in the home of the patient, because the physician cannot have such control of him and his surroundings as is essential to success. This control must be complete during the early part of convalescence, as well as during the treatment, and the physician must know, beyond peradventure, that he has no access to his drug or any substitute for it.

Under this plan of treatment the therapeutic measures necessary are soon completed, but the end sought is not merely to take the patient off of his drug and place him where his physical condition will not require its use, but, in addition, to so fortify him mentally and morally that he will not return to the use of the drug from sheer force of habit or otherwise.

The psychological element is an important one and should be intelligently considered and skillfully managed. The fixed habit of dependence upon a drug is to be supplanted by a counterhabit of independence and self-reliance, and both time and discipline are essential factors in that process. This is one of the chief reasons why no tonic or after- treatment should be given.

So long as the patient takes anything his mind clings tenaciously to the idea that his well-being depends upon his receiving some support, some outside assistance, and

he is thus led away from, rather than toward, self-dependence.

No patient of this class, under any treatment, is secure from relapse if he is discharged taking plain water, if he thinks it is medicine. A protracted course of treatment tends to perpetuate the habit of invalidism and defeats the very object sought in the treatment. The patient must be taught to rely entirely upon his own resources and fully convinced of his ability to do so.

He must not only be cured of the addiction, but thoroughly fortified against relapse. This can certainly be done, but the time required varies with different individuals. Some will more completely regain their mental and moral equilibrium in a few weeks' time than others will in several months, but until this has been attained, at least to a fair degree, the patient should not be discharged.

Association with other convalescent patients, the comradeship thus established, and the encouragement the patient receives from witnessing the successful recovery of others will be found helpful in establishing the patient in his new position. Nothing less than the complete and permanent emancipation of every patient treated should satisfy us. It should be borne in mind that the use of opiates does not cause structural changes in the brain or other tissues of the body, but that the derangements due to their use are purely functional and, therefore, are certainly and permanently curable.

During the period of convalescence the patient should live as much as possible out of doors. He should be encouraged to walk, play pool, billiards, basketball, or tennis, or any outdoor game. The exercise incident to the playing of these games keeps the skin active, keeps the general muscular system in better condition, and

converts a part of the newly acquired flesh into stout muscular fiber instead of allowing it to accumulate as fat. The course of physical training that the author employs has proven very helpful in his hands. This course will be given in detail in a later chapter of this work.

Every institution should have as a part of its equipment a well-trained masseur. Massage is one of the accessories of treatment which is often of the very greatest service. A good general massage often relieves pain in the legs and back or other parts of the body and enables the patient to secure several hours' quiet, restful sleep.

Sleep secured from drugs is not so refreshing as normal sleep and the patient feels the depressing effects of the drug on the following day, whereas the sleep induced by a neutral bath or a good massage is practically natural sleep and is not followed by depression. These accessories are of the greatest value; in fact, they cannot be overestimated.

Every means that is rational and which does not involve the administration of drugs should be used to make the patient's convalescence comfortable and successful. Medicines do not often aid materially; in fact, medicines should not be given, unless there is a specific indication for their use.

The patient is to be thoroughly weaned from the medicine-taking habit, not one drug substituted for another. Therefore, all the physical means and all the rational physiological measures that can be used as accessories should be brought into play. These do not make a damaging impression on the patient such as the administration of drugs does, and, therefore, should be employed to the exclusion of drugs in every case when they can be made to serve the purpose.

CHAPTER IX.

TREATMENT (Continued).

REMEDIES EMPLOYED.

SPARTEINE SULPHATE.

In carrying out the rapid or immediate withdrawal of opiates from those addicted to their use some reliable agent for the support of the heart is often essential. Sparteine sulphate has served this purpose in the hands of the author better than any other agent in the entire materia medica. It is unfortunate that this valuable remedy should not be better known to the profession, and especially that its dosage should be so misunderstood.

In looking up the literature on this subject the author has found the widest difference of opinion existing among men of equal standing and who are doubtless equally accurate in their observation of the effects of remedies. The difference, however, in their statements as to the effects of this remedy is accounted for, in the author's judgment, by the difference in their views as to the proper dose of the remedy.

The misunderstanding as to the size of the dose is doubtless the reason this remedy is not now in general use. Most authors give its dose as from $\frac{1}{5}$ to $\frac{1}{3}$ grain. The U. S. Pharmacopœia, last edition, stated a dose to be $\frac{1}{5}$ grain, but the hypodermic tablet makers have not, until recently, made a tablet larger than $\frac{1}{10}$ grain and few of them have listed a tablet larger than $\frac{1}{30}$ grain. These are the quantities in which it has usually been tried, but many practical men after making a trial of it

in these quantities, being unable to develop the desired effects, have thrown it aside as of no value; while had the proper dose been given, the results would have been otherwise. The fault was not with the remedy, but with the size of the dose.

Bartholow and Ringer are the only authors whose writings the author has examined who state the dose at anything like the proper quantity. They put the dose at from ½ to 2 grains. One and one-half to 2 grains would be more nearly correct; in fact, 2 grains by the stomach are as small a dose as can be depended upon. One and one-half grains, hypodermically, is a fairly effective dose, but there is no reason why the hypodermic dose should not be 2 grains also.

It is a non-toxic drug when administered in any reasonable quantity. It is certain and definite in its effect and, in the author's experience, it above all other remedies deserves to be classed as a heart tonic, a heart regulator. It does just what we want done when we administer a heart tonic without doing those things which we do not want done.

It combines the desirable effects of the digitalis and veratrum without their undesirable effects. Since physicians are so familiar with these remedies, the author will compare the effects of sparteine with those of these two drugs.

Digitalis is a true heart tonic so far as its effect on the heart muscle itself is concerned, but, while it adds tone to that organ, lessens the frequency and increases the force of its action, it also powerfully contracts the entire arterial capillary system and greatly raises blood-pressure, thus increasing the resistance to the onward flow of the blood-current. So marked is this effect that it is probable that it adds to the work of the heart as

much as it increases its strength; therefore, as a heart tonic it is almost useless.

Veratrum, on the other hand, reduces the force and frequency of the heart's action and at the same time dilates the arterial capillaries, thus reducing blood-pressure and opening up the way for the onward flow of the blood-current, but this action is attended by great depression, nausea, and other undesirable effects. If we could develop the effects of digitalis on the heart muscle accompanied by the effects of veratrum on the arterial system without any of the other effects of these two remedies we would have an ideal heart tonic. In sparteine we have a remedy that does that very thing.

It adds to the tone of the heart muscle as greatly as does digitalis; it also reduces the frequency and increases the force of the heart action, but, instead of contracting the arterial capillaries and raising blood-pressure, as digitalis does, it has directly the opposite effects. While it does not dilate the arterial capillaries so greatly as veratrum does, it does so to a marked degree, but without any of the unpleasant effects peculiar to that drug.

Especially marked are its effects upon the arterial capillaries; in this respect it resembles belladonna; however, its effects are not confined to the superficial capillaries, but extend to the deeper capillaries as well. Under its influence the pulse is soft, full, and compressible, instead of hard and unyielding as from digitalis.

It is prompt in action. Its effects are well established within an hour; in fact, if given hypodermically, the effects are quite noticeable within half an hour or less, being in that respect very unlike digitalis, but in point of duration of effect it is again like digitalis, the effects lasting from six to twelve hours. In fact, it has almost the promptness of strychnine, with the sustained action of digitalis.

In the matter of correcting irregularities of the heart action it should be given first place. It corrects these with great promptness, and the sustained effect of the drug makes its frequent administration unnecessary. An initial dose of 2 grains should be given and it should be repeated in two to three hours. After that it need not be administered oftener than every four to six hours.

Sparteine is a true and reliable heart tonic, an excellent non-irritating diuretic, and is entirely free from untoward or objectionable effects; it lessens the frequency and increases the force of the heart action, but does not raise blood-pressure. This is made possible by the fact that it is also a vasodilator and by this phase of its action it dilates the arterial capillaries to such a degree as to enable the arterial system to receive and accommodate the increased volume of blood propelled by the more vigorous action of the heart without increasing arterial tension.

It adds tone to the heart muscle and causes it to propel a larger volume of blood at each impulse, and by its vasodilator action it opens up the way for the passage of this increased volume of blood, thus increasing the propelling force and lessening the resistance. This makes it the ideal heart tonic, and in the experience of the author it is the only remedy or combination of remedies which meets this indication perfectly. It is also taken up readily from the stomach. The effect on the stomach is that of a bitter tonic. It has no tendency to cause nausea or other unpleasant symptoms.

There has been quite a conflict in the statement of writers as to the effect of sparteine on the blood-pressure. Some say that it raises blood-pressure; others, that it decreases blood-pressure. This is quite in accord with their statement as to its general effects. In the literature

of the subject the author has found that those who have given sparteine in doses of 2 grains have been uniformly pleased with its effect and have given it the highest praise, both as a heart tonic and a diuretic; but on the other hand, those who have used the drug in fractional-grain doses have condemned it as inert or of little value and have made conflicting statements with reference to its effects on blood-pressure.

The author has recently made a careful study of this particular effect of the drug and is able to present herewith instrumental tests showing a uniform, but slight decrease of blood-pressure in every case where as much as 2 grains of the drug were given.

The fall of blood-pressure begins within an hour from the time of giving a dose and reaches its minimum about the end of the sixth hour, and this reduced pressure continues for four to six hours after the minimum is reached. A uniform fall of from 10 to 15 mm. Hg has been noted in every case thus far observed by the author and in no case has there been the slightest degree of rise of blood-pressure.

The effect on the pulse was noticeable earlier than the instrument would show the change in blood-pressure. A pulse which is small and deficient in volume fills out to a well-rounded pulse in from thirty to sixty minutes after the administration of the full dose of sparteine and this effect is sustained for several hours. It begins to wane by the end of the fifth or sixth hour, but the blood-pressure does not begin to rise for several hours afterward. The accompanying sphygmographic tracings show the effect on the heart in the matter of regulating its action.

In this connection the author wishes to call attention to an element in the action of sparteine not heretofore noted, that is, that, while the usual or ordinary effect of

the remedy is to slow the heart action, in certain conditions it increases the rate. The sphygmographic tracings and pulse records in the first three cases which follow illustrate this phase of its action as well as its effect as a heart tonic.

In the first 2 cases there was irregular heart action, the irregularity consisting of an extra prolonged diastole occurring at regular, but frequent intervals as if the heart muscle was tired and was seeking to rest for a fraction of time longer than normal, and then regular contractions would occur again, to be followed, in turn, by a prolonged diastole.

Two grains of sparteine were given, and, this having imparted a reliable degree of tone to the heart muscle, the time formerly occupied by the prolonged diastole was filled with regular contractions and this resulted in increased pulse rate as well as regular and uniform action. This increase in one case was 4 and in the other 6 beats per minute.

In the third case there was very slow and sluggish heart action, conveying the impression of a tired heart, one that not only needed rest, but was seeking to take it. Sparteine in this case imparted power and tone to the heart muscle, filled out the volume of the pulse, and increased the rate from 52 to 74.

The author has repeatedly observed this effect from sparteine and now does not hesitate to say that sparteine has the power to regulate action of the heart, but that in doing so it always tends to restore its action to the normal or in the direction of the normal, both in rate and volume. It imparts a degree of muscular tone, which enables the heart to act more normally, and therefore it deserves to be classed as a true heart tonic.

Tracing No. 1 shows patient with a regularly irregular heart action, the irregularity being one full long contraction with two intervening shorter contractions, followed regularly by one long and two short beats. Pulse rate, 70; blood-pressure, 125.

Tracing No. 1.

Tracing No. 2 is from same patient two hours later and two hours after 2 grains of sparteine had been given by mouth.

At the time of taking this tracing the pulse rate was 74, an increase of four beats to the minute, but the blood-pressure had fallen to 120. It will be noticed that the heart action had become perfectly regular and the longer

Tracing No. 2.

upward stroke of the needle shows increased volume of pulse. Tracing No. 3 was taken seven hours later, and this shows a distinct waning in the effects of the remedy as indicated by shorter upward stroke of the sphygmographic needle.

The pulse rate at the time of taking tracing No. 3 was 76; blood-pressure, 115. While the volume of the pulse had decreased considerably at the time of taking

tracing No. 3, the irregularity shown in tracing No. 1 did not show; in fact, this irregularity did not recur to such a degree as to be noticeable until twelve hours from

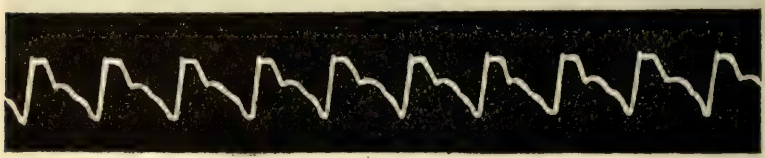
Tracing No. 3.

the time of taking tracing No. 1, or fourteen hours from the time of giving the single 2-grain dose of sparteine.

Tracing No. 4 is from a similar case in which there

Tracing No. 4.

was a regularly irregular pulse, the irregularity consisting of one long and five intervening shorter beats. The pulse was full and strong, but regularly irregular.



Tracing No. 5.

One and one-half hours after 2 grains of sparteine had been given hypodermically tracing No. 5 was taken. At the time of taking tracing No. 4 the blood-pressure was 130; pulse rate, 68. At time of taking tracing No. 5 the blood-pressure was 120; pulse rate, 74.

It will be noticed that in each of these cases the effects of sparteine in correcting the irregularity increased the pulse rate slightly. This is directly opposite to its effects when there is no irregularity to correct. Where the heart action is weak and the muscle lacking in tone, it imparts strength and tone, but decreases the rate; this decrease in rate is usually from 5 to 10 beats per minute, but when the heart action is very rapid and weak the decrease in rate is often 20 to 40 per minute.

When the heart action is abnormally slow and weak, sparteine acts as a regulator both of the volume and

Tracing No. 6.

frequency of heart action. In such cases the added muscular tone brings the heart action up nearer to the normal, even if that be to increase the frequency of its contractions as well as increase the volume of blood propelled by each contraction. This is shown by tracings 6 and 7, in Case III, which follows. In this case the pulse was abnormally slow and thready, the rate being 52 per minute; blood-pressure, 125.

Two grains of sparteine were given hypodermically and in thirty minutes distinct improvement in the volume of the pulse could be detected. Tracing No. 7 was taken two hours from the time the sparteine was given. At the time of taking this tracing the pulse rate had increased to 74 and the blood-pressure had fallen to 120. The difference in the tracing indicates the improvement in the volume.

Six hours after tracing No. 7 was taken, or eight hours from the time the sparteine was given, tracing No. 8 was taken. At this time the effects of the remedy had been partially exhausted, as indicated by the decreased volume of the pulse. The rate had also become slower, it now being 65 per minute, but that the remedy

Tracing No. 7.

was still exerting considerable influence is shown by comparison of tracings Nos. 6 and 8.

While the author's conclusions as to the physiological effects and therapeutic use of sparteine are based solely upon his own clinical study of the remedy, he finds that

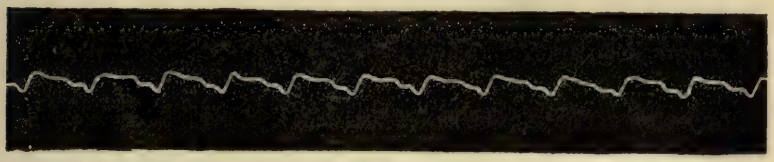
Tracing No. 8.

Oscar Jennings, of Paris, France, had preceded him in making such a study. The conclusions arrived at by the author and Jennings, each acting independently of and unknown to the other, harmonize to such an extent and so fully sustain each other that the author takes pleasure in quoting the following from Jennings's work:—

"The want of morphine shows itself by certain symptoms which, as I have said, are natural indications of the treatment required. It should be borne in mind that when giving up mor-

phine it is a question of giving up not an habitual sedative, but principally a stimulant, and a stimulant of such transcendent power that the vital collapse which results from its suppression far exceeds anything that could result from the privation of any other stimulant.

"By gradual reduction and change from the more stimulating hypodermic to the sedative rectal injections, the collapse that would have resulted from sudden hypodermic suppression has been avoided; but if there were nothing now to be done beyond progressive reduction of the morphine, as is the case outside of my treatment, the final suppression, unless spread over a long



Tracing No. 9.—From morphine patient in state of want.

time, would still give rise to a great deal of discomfort. Observation, however, shows that the suppression of morphine, which amounts practically to the suppression of a fictitious vital force, gives rise to general functional depressions and metabolic perversions, and these disturbances serve as our guide to treatment.

"The heart is nearly always affected in its functions, and the sphygmographic tracing shows a sluggishness that is only too eloquent as regards discomfort. This constitutes my first therapeutic indication.

"The above tracing (No. 9) from a former communication to the Academy of Medicine shows the pulse of a patient who is in want of his dose of morphine.

"Tracings 10 and 11 are practically identical, but, while the first is the effect of a dose of morphine, the second shows the effect of an injection of sparteine.

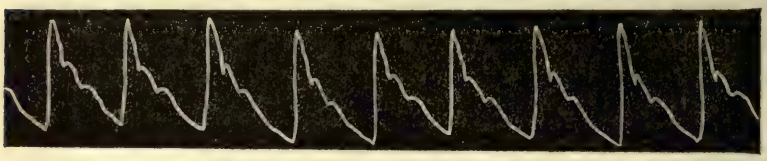
"Heart tonics form, then, my first means of preventing the craving. The first of the three tracings shows a peculiar plateau

caused by the want of cardiac impulsion, together with a resistance to the passage of blood in the vessels. A hypodermic injection given at this time re-establishes the normal state of the circulation, as is shown in the second tracing, taken from the same patient as the first at an interval of a few minutes. It was the study of these tracings that suggested the use of cardiac

Tracing No. 10.—From same patient with pulse restored by morphine.

tonics and stimulants as substitutes for the morphine, and, in so far as the heart is concerned, the third tracing shows how completely they can replace it.

"As is the case for each of the means of treatment I have proposed, the utility of heart tonics has been endorsed by every subsequent French observer. I shall content myself with one quotation only:—



Tracing No. 11.—From same patient, showing the restoration of the pulse after a state of want by injection of sparteine.

"'The pulse of the morphine habitué,' says Pichon,* 'does not afford to the finger any important indication . . . but there is a registering apparatus, the sphygmograph, which compensates for this insufficiency as regards delicacy of touch, and which analyzes the slightest arterial anomalies. It is in this manner that the experiments to which we refer, and which we had the

"*'Du Morphinisme,' Paris: O. Doin, 1890."

good fortune of witnessing, were made. . . . These researches were made by O. Jennings, attached to the laboratory of Professor Ball, upon the numerous morphine habitués who were attending the clinic at the time. . . . Before arriving at a definite result, Jennings took a series of tracings from patients in different stages of morphinism—state of want, state of satisfaction, intermediary condition, normal condition.' Pichon then gives the conclusions of the communication presented by Professor Ball and myself at the Academy of Medicine, and adds: 'Nous avons controle a plusieurs reprises ces savantes recherches. Nous avons pris un tres grand nombre de traces, et nous sommes arrive aux memes resultats.' He then points out that the sphygmographic examination of the pulse is, as I have always taught, the best way of telling whether a patient is honest or not in carrying out the prescribed reduction. If the plateau is not obtained when the patient ought to be in a state of want, there need be no hesitation —he takes morphine secretly. 'This discovery has been the pivot,' he continues, 'of the *physiological treatment,* which appears to have given' [as we shall see at the end of the chapter] 'very good results.' 'After numerous trials, Jennings found that the sphygmographic tracings, after the use of sparteine and trinitrine, gave the same results as an injection of morphine. The problem was solved physiologically and clinically. It [the treatment] often gave before us excellent results. . . . Most interesting practical consequences result from these physiological discoveries, both as regards diagnosis and treatment.' Further on, after passing in review the different treatments that have been advocated, Pichon concludes: 'We should prefer the physiological treatment of Jennings, based upon the action of sparteine and trinitrine. . . . We have seen that these two therapeutic agents replace absolutely the circulatory action of the morphine euphoria, and overcome the state of want by causing the disappearance of the plateau.'

"Further on he confirms the value of sparteine in causing the disappearance of discomforts brought about by depression of

the heart. 'According to the patients,' he says (quoting from my communication to the Academy of Sciences), 'this medicine *gives them heart.* The indications of the sphygmographic tracings show how this familiar expression is rigorously exact from the point of view of the physiological action on the heart. Sulphate of sparteine increases the contractile energy of the heart, regularizes its rhythm, acts with great rapidity, and possesses a considerable persistence of action. These are properties that render it extremely precious in the period of abstinence, and make it a *medecine de choix.*'"

While sparteine is a remedy of the greatest value in the treatment of drug addiction, as well as in all other conditions which require the support and regulation of the heart action, it is in pneumonia that it fills a place that no other remedy or combination of remedies fills equally as well.

In that disease we have an overworked heart, high blood-pressure, pulmonary and general venous congestion, and death results from failure of oxidation of the blood due to heart exhaustion. Sparteine counteracts the development of this condition more perfectly and does more to correct it after it has developed than any other drug with which the author is acquainted.

It decreases the frequency and increases the force of the heart action, imparting a reliable degree of tone to the heart muscle. At the same time, by dilating the arteries and reducing blood-pressure, it relieves the heart of its burden, thus enabling it to handle the volume of blood without laboring and to throw an ample current to the lungs, where the improved capillary circulation which it induces promotes abundant oxidation.

It does this without a single unpleasant, undesirable, or hurtful effect. In fact, the only other effect of the

remedy is one which in pneumonia is needed almost as badly as the one which has just been described. Its power to improve the arterial capillary circulation renders it a most certain and efficient non-irritating diuretic. In pneumonia, as well as in drug addiction, its diuretic effect is a very helpful one.

The following cases will illustrate its promptness, efficiency, and usefulness:—

Case I.—I. McF., admitted Feb. 8, 1900. In coming from home he traveled a part of the way overland through a drenching rain and was wet and shivering from cold when admitted. He was 65 years old and had used gum opium by mouth habitually for twenty-seven years. He was put to bed after a hot bath and soon became comfortable. That evening he was given a thorough eliminating course and by noon the next day his intestinal canal was well emptied, and so far as could be seen at that time there was no ill effect from his exposure. The opiate was then withdrawn and the patient was kept moderately under the influence of hyoscine for the next two days, during which time calomel in small doses was given to stimulate the action of the glandular system.

On the fourth day of treatment, when it was sought to discontinue all narcotic drugs, the patient began to show signs of pneumonia and in a short time that disease was well developed. His condition was recognized as one of extreme gravity from the beginning, because of his age and feebleness and of the long-standing drug addiction, as well as because of the large area of the lung involved. The temperature ran high and other symptoms were of corresponding severity.

The author had been accustomed to rely upon digitalis, strychnine, and whisky for support of the heart in

such cases. These were freely administered, and the administration of an opiate was resumed, but, notwithstanding every effort to support him, by the fourth day of the attack, a fatal termination within twelve to twenty-four hours seemed inevitable. His pulse was 120 when reclining quietly, but the slight exertion of raising him to a sitting posture would increase the rate to 150. Respiration was 40 and labored; face livid; in fact, the general carbon-dioxide poisoning was rapidly developing.

The author had had some experience with sparteine prior to that time, but not enough to gain much confidence in it. Still, it was evident that other remedies were failing and it was decided to give sparteine a trial. Accordingly, 2 grains of sparteine sulphate were given hypodermically, and this was repeated at intervals of two hours. At the time of giving the second dose a distinct improvement in the patient's condition could be seen and within six hours the change was very marked. The pulse had come down to 90 per minute and the volume and quality were very much improved; breathing, 30 per minute and much less labored. Assuming the sitting posture now only increased the pulse rate 10 per minute instead of 30, as before.

The digitalis and strychnine were discontinued, but no other change was made in the general line of treatment. By the end of the first twenty-four hours after beginning the sparteine the pulse rate was 70 and from that time on throughout the attack the pulse was held between 70 and 90 and the patient made an uninterrupted recovery. Sparteine, in doses of 2 grains, was given hypodermically every two hours for the first six days and then the intervals were lengthened to four and finally to six hours. Its administration was kept up three

weeks altogether, by the end of which time the patient had gained sufficient strength not to require support.

After the administration of sparteine was begun it was depended upon entirely for control and support of the circulation and it met these indications more perfectly than any other drug had ever done in the author's hands.

This experience led the author to make very free use of this agent and to study its action closely. During the twelve years intervening since this experience, the author has used sparteine most freely and in a large and varied series of cases, and is sure that it has enabled him to meet successfully many extreme conditions which he could not have otherwise met. One of the most marked was an infant of six weeks in which there was failure of closure of the foramen ovale. This little patient was under the care of Jordan and Goree, of Pine Bluff, Ark.

Case II.—G. E. B. At birth the child appeared to be entirely normal, but at six weeks of age it began to show signs of venous stasis, bowels became torpid, and as the portal engorgement increased the heart action was more embarrassed and a real "blue baby" was soon the result.

Physicians were called and the treatment begun. Calomel and other evacuants were administered, but without favorable results. Strophanthus and nux vomica were given in sufficient quantities to establish the full physiological effects of these remedies, but in spite of all treatment the condition of the patient grew worse. The heart action became more rapid, the general venous congestion more marked, and the breathing extremely embarrassed.

The author saw the child on the third day from the development of the more marked symptoms. The con-

dition of the patient seemed to be beyond hope; the pulse could not be detected at the wrist; breathing, 90 per minute, and the entire body was as blue as the proverbial "turkey gobbler's snout." It did not seem possible for the child to live an hour longer.

The patient was in the hands of two of the most competent physicians in the city and their treatment was in accordance with the teaching of the best authorities, but no improvement had been made in the condition of the little patient by anything which had been given. These physicians extended the author the courtesy of giving whatever he thought best, but there seemed nothing left for him to do but to give some soothing potion and let the little fellow die in less distress. With that idea in mind, $\frac{1}{60}$ grain of heroin was given. At the end of half an hour the child was still alive, but more stupid. Breathing was rapid, but was attended with less effort and was shallower.

The author felt that, as the child had not died during this half-hour, it would be wrong to sit idly by and do nothing, so he decided to give $\frac{1}{10}$ grain of sparteine sulphate. This was done and in thirty minutes signs of improvement were detected. Breathing became less labored and by the end of thirty minutes more this and other signs of improvements were unmistakable. Two hours from the time of giving the first dose of sparteine, $\frac{1}{20}$ grain more was given. At this time the respiration had decreased to 70 per minute and the pulse could be detected at the wrist, but could not be counted. In two hours more, or four hours from the time the first dose of sparteine was given, the respiration was 60, pulse 150, and could be counted at the wrist. The deep livid hue had given way to a bright arterial flush, resembling somewhat the flush from belladonna. The child nursed,

and fell into a natural sleep, for the first time in three days.

The improved circulation with the attendant areation of the blood soon restored the nervous system to its normal responsiveness and then the purgatives, which had lain dormant in the system for two or three days, began to act and continued to do so until the bowel was well emptied. This, of course, overcame the obstruction of the portal system, which was doubtless the cause of the original attack, and the child was practically well within twenty-four hours.

Sparteine in $\frac{1}{20}$-grain doses was continued for a week at intervals of four hours and then the periods between the doses were lengthened to six hours and these were kept up for five months, at which time they were discontinued. No further disturbance of the circulation occurred and the little patient is now a strong, healthy child.

Sparteine is the alkaloid derived from *Cysticus scoparius,* or common broom corn. The sulphate is the only salt of this alkaloid on the market, and it is doubtless as satisfactory for general use as any that can be made. It is slightly deliquescent, but if kept in stoppered bottles it maintains its dry, crystalline form. This salt is readily soluble in water at ordinary temperatures and may be administered hypodermically, by mouth, or by rectum.

In studying the effects of any drug the only rational course is to administer that drug alone, uncombined, in such doses and at such intervals as to establish its full physiological effects in the system. After maintaining that effect for a reasonable time, if the therapeutic impression or remedial effect sought to be made has not materialized, then one has reason to doubt the efficacy of

the remedy. Confirmation of such experience by repeated trial would justify the entire rejection of the remedy, but until such a study of its effects has been made no therapeutic agent should be said to be of no value.

Those who have used sparteine according to this rule hold it to be one of the most valuable therapeutic agents in our entire list, classing it along with such remedies as calomel, quinine, strychnine, morphine, etc. Those writers who consider it of little value place the dose at $\frac{1}{30}$ to $\frac{1}{4}$ grain. Such doses are entirely insufficient and will disappoint anyone who may depend upon them.

The writer has made a careful study of this remedy, having used it in doses of all sizes from the fractional grain up to 3 grains given at intervals of two hours. It was found, however, that doses of 2 grains given at intervals of from three to six hours would establish and maintain the full physiological and remedial effects of the drug upon an average adult. In cases where the effect of the remedy is urgently needed it is best to give 2 grains and repeat that dose at the end of two hours; then the dose may be continued at intervals of three to four or six hours, as seem indicated.

It is a reliable, non-irritating diuretic. This action occurs whether the remedy be given hypodermically, by the mouth, or by the rectum. The general improvement it induces in the systemic circulation, especially that of the arterial capillary circulation, extending to the kidneys, would result in diuretic action; but it seems to have an *elective* action for the kidney circulation, its diuretic action being marked. It has no diaphoretic action.

Sparteine has been found very useful in postoperative suppression of urine. In discussing the paper

Montgomery read before the North Carolina State Medical Association at Raleigh, May, 1904, the author called attention to sparteine as a reliable, non-irritating diuretic which could be administered hypodermically. Stuart McGuire was present and heard the discussion, and from that he began the use of sparteine in such cases in 2-grain doses. As a result, he reports in *American Journal of Surgery* of February, 1907, 6 cases of postoperative suppression which he feels sure he would have lost under his former management, but which were saved by the administration of sparteine. He gives the entire credit for recovery of these cases to sparteine.

This experience has brought him into entire accord with the statements of the author that the only reason that the drug is not in common use is because it has been tried in doses entirely too small to be effective. He says: "To get results, it must be given in doses of 1 to 2 grains, repeated every three to six hours." When so given, he says that he has "repeatedly seen it slow a runaway heart and set in motion the pair of stalled kidneys."

In surgical cases sparteine is also of great value in preventing shocks and postanesthetic nausea. Its power to sustain the heart action during the anesthesia reduces shock greatly, if it does not entirely prevent it. If the shock is avoided, postanesthetic nausea rarely occurs, provided the intestinal canal has been properly emptied before the anesthetic was given. The notes of 2 cases which follow are fairly typical of the series of 40 consecutive cases in which the author prepared the patient for operation, in none of which nausea followed the anesthetic.

Case III.—J. B. G., hip-joint amputation. Tubercular. Operation by Crisler.

The patient was prepared for operation by administration of calomel, 10 grains; extract of cascara, 10 grains; ipecac, 1 grain; strychnine nitrate, ⅕ grain; atropine sulphate, 1/50 grain, made into four capsules, one given at 4, 6, 8, and 10 P.M. on an empty stomach, followed the next morning by 3 ounces of castor oil. Forty-eight hours later a course of the same strength was given, followed the next morning by oil. This was twenty-four hours before the operation. The patient was then put on 2 grains of sparteine every three hours by the mouth and was given liquid nourishment up to within a few hours of the time of the operation. One hour before the time of the operation 2 grains of sparteine and ¼ grain morphine with 1/100 grain hyoscine were given hypodermically.

The patient went on the operating table with pulse 84. Ether was used and the operation lasted one and one-quarter hours. During that time there was practically no variation in the pulse rate or volume, and at the completion of the operation the pulse rate was 88, full, strong, and regular. Just before the close of the operation 2 grains of sparteine were given hypodermically, and these doses were kept up at intervals of four hours for several days; the patient was given 1 pint of saline solution by rectum and put to bed. No nausea followed and shock was not perceptible. Patient was allowed water up to the time of operation and was given hot liquid nourishment, half-glass five hours after operation, and this was repeated every two to three hours during the following day; then other nourishment was given.

Case IV.—Cervix and gall-bladder. Operation by Max Henning.

Patient prepared for operation as in former case and was given sparteine, 2 grains by mouth every four hours for last twenty-four hours before operation, the last dose coming one hour before time of operation, at which time ¼ grain of morphine and 1/100 grain of hyoscine were given hypodermically. Ether was the anesthetic employed. Pulse at time of beginning opera-

tion was 84, at close of operation 90, with no perceptible change in volume. Shock was practically *nil*. Sparteine was continued at intervals of four hours, 1 pint of saline by rectum as soon as patient was put to bed, and hot water to drink was allowed three hours after operation and from that time on was given as freely as the patient wished. Buttermilk was given nine hours after the operation. The patient was not nauseated in the slightest degree at any time.

In this series of 40 cases, in which the preliminary purgation was carried out with the same degree of thoroughness above noted and the patient kept under the influence of sparteine for twenty-four hours before the operation, shock has been hardly perceptible and nausea has not occurred; whereas with the same care in preparation of the patient without sparteine, vomiting occurred after the anesthetic in a majority of the cases; the pulse rate was frequently from 20 to 40 per minute more rapid at the close of the operation than at the beginning and the operation was attended by the usual degree of shock.

When the patient's intestinal canal has been thoroughly emptied and portal engorgement overcome before the operation, and the patient is well under the influence of sparteine at the time of operation, it is rare to have a variation of more than 10 beats per minute in the pulse rate during a prolonged operation. Shock is much reduced and nausea rarely occurs. This result cannot be expected from the administration of sparteine in emergency work where there is no time for cleansing the patient's system of toxic matter; neither can it be expected in cases where a saline cathartic alone is depended upon to empty the intestinal canal, but even in these cases sparteine contributes materially to the safety and comfort of the patient.

The administration of sparteine after the operation is also beneficial. It insures a more uniform and efficient circulation, especially a better capillary circulation, and this tends to promote primary union.

This reference to the value of sparteine in surgical cases is given here because it is frequently found necessary to operate on those who have been recently taken off the narcotic drugs. The chronic ailments which establish the addiction frequently remain and must be cured by a surgical operation after the drug is withdrawn. In these cases, when nausea and vomiting are permitted to occur after the operation it is extremely difficult to refrain from giving an opiate to quiet the patient. This is not admissible in those who have been recently taken off the drug; that is to say, if it is found necessary to give an opiate following the operation they soon get back into dependence upon it, thereby making another treatment for the addiction imperative.

With this plan of management of the cases the author has been able to have his patients operated on, and to conduct them through the convalescence from the operation without re-forming the drug addiction. Whereas, when they have been called upon to suffer two or three days intensely from postanesthetic nausea, he has not had the heart to deny them the relief an opiate would give them, even if it did make an additional treatment for the addiction necessary. It is with a hope that these suggestions may be helpful to others who have to contend hand to hand with these conditions that they are here given.

Sparteine sulphate sells in the market for about 70 cents per ounce wholesale. Merck's, Mallinckrodt's, Squibb's, and Powers & Weightman's preparations have been found equally reliable. For hypodermic use 2

grains dissolved in 20 minims of water constitute a solution of suitable strength for use. This causes pain when injected into the tissues, but in many thousand injections the writer has not had an abscess from it. If the solution is injected very slowly it does not cause as much pain as it does when the full dose is injected quickly. For stomach administration the capsule is the most convenient vehicle. A No. 4 capsule holds practically 2 grains and that is a safe and efficient dose.

In endeavoring to secure some salt of sparteine which was less irritating to the tissues when injected hypodermically the author secured from Merck & Co. a supply of the hydrochloride of sparteine. This salt was found to be very deliquescent and difficult, therefore, to preserve, but after giving it a thorough trial the author reached the conclusion that it had no advantage over the sulphate. When a solution of the hydrochloride of the same degree of concentration was used it proved to be equally as irritating to the tissues as did the sulphate; therefore, its use was given up, and the use of the sulphate resumed. Sulphate and hydrochloride are the only salts of this drug listed by the manufacturing pharmacist in this country, and, so far as the author has been able to learn, these are the only salts of it which are made.

CHAPTER X.

TREATMENT (CONTINUED).

REMEDIES EMPLOYED.

GELSEMININE.

GELSEMININE is another remedy which the author has found particularly useful in the treatment of drug and alcohol addiction. This is used either in the form of specific tincture of gelsemium or of the alkaloid gelseminine. This remedy has been urged as of great value by the Eclectic School of Medicine, but, as physicians of the regular school of medicine are the true eclectics, it has been engrafted upon our therapeutic list.

Gelsemium is a motor depressant and cerebral sedative. It also has mild antipyretic properties. These properties combined make it a reliable nerve sedative. In cases of extreme nervousness, especially attended with pain in the back, or with pain in the hollow internal organs, gelseminine has a very happy effect.

It depresses the spinal centers, and thus decreases the tendency to irregular or spasmodic muscular contraction. In neuralgia or myalgia occurring in drug patients during the first week or so of convalescence, this remedy may be used with great benefit. It has no harmful after-effect. As its effects are established, the patient experiences a calm, soothing quietude, which is frequently attended by restful sleep.

To get the best effects from gelseminine it should be given in doses of $\frac{1}{25}$ grain, repeated at intervals of two hours, until the full physiological effects of the remedy

are manifest. While gelseminine is poisonous if given in excessive quantities, it can be pushed until its full physiological effects are established without the slightest danger of toxicity. Its effects on the eyelids are very marked, causing them to droop, and the remedy can safely be given until that effect is clearly noticeable. When ptosis is developed, the dose should be reduced. This is always within the bounds of safety.

PILOCARPINE.

Pilocarpine is another remedy of considerable value in drug cases; in fact, it might be said that it is one of great value, especially during the period of convalescence.

A number of writers have advocated the use of pilocarpine in combination with hyoscine, for the purpose of overcoming the dryness of the throat and mouth from the effects of that remedy. The writer has made careful tests of pilocarpine for this purpose, but has not seen any benefit from it. It is true that it does overcome the dryness of the mouth and throat to some extent, but while doing this the secretion it excites from the mucous membrane of a patient under the influence of hyoscine is of a tenacious, sticky type, which the patient finds great difficulty in expectorating. It clings to the lips and often requires repeated efforts to free it from them. This tenacious secretion is much more disagreeable than the dry throat and mouth which it is given to relieve.

Therefore, it is not at this stage of the treatment that the author considers the remedy of any value. It is useful, however, for the purpose of reducing fever, which these patients have for some days after the withdrawal. This temperature, running from ½° to 1½°, is promptly reduced by ⅙ or 1/10 grain of pilocarpine.

This induces gentle diaphoresis, and usually an hour or two of quiet sleep. This sleep is not followed by any unpleasant or hurtful after-effect.

While pilocarpine is not classed as hypnotic, still in these cases, when there is a temperature of ½° to 1½°, a hypodermic of pilocarpine given at bedtime promptly reduces the fever. The perspiration incident to this remission is not excessive, but the general relaxation of the system which accompanies it brings on a state of quietude and relaxation which induces sleep. This sleep continues sometimes as much as three or four hours. It is not really a drug sleep, but a sleep from defervescence induced by the physiological effects of the remedy.

A serious objection to the repeated administration of pilocarpine in these cases arises from its effect on the gastrointestinal mucous membrane. If this remedy is repeated too frequently, for several days in succession, it induces a diarrhea which may be troublesome; therefore, it is not recommended for repeated or prolonged use, but as an occasional remedy, especially for a dose at bedtime for a few nights. Given in this way, it is of great value. It should not be given soon after a meal, since if the stomach is full it is likely to produce nausea.

ASPIRIN.

Aspirin is another remedy which has proven of considerable value in the author's hands. It is a reliable antipyretic and analgesic, and is quite free from hurtful after-effects. In fact, what after-effects it has are wholesome, being antiseptic in character. Aspirin is derived from salicylic acid and is broken up in the intestinal canal into its constituent elements, thus liberating salicylic acid in the intestinal canal, and this is a valuable antiseptic.

Aspirin is much more reliable, as an antipyretic, in drug cases than any of the coal-tar derivatives. The coal-tar derivatives have but little effect on the temperature which follows the withdrawal of the opiate, but aspirin in full doses reduces this temperature very promptly and in a most satisfactory manner. Ten grains is usually an effective dose.

HYDROCHLORIC ACID.

In many drug cases the author has found deficient secretion of hydrochloric acid after withdrawal of the drug. The earlier writers thought there was an excess of hydrochloric acid; in fact, they demonstrated the presence of an excess of hydrochloric acid during the use of the narcotic. They attributed the hyperacid condition found to be present to overproduction of hydrochloric acid.

But this hyperacidity is evidently due to underconsumption of acid resulting from the semiparalyzed condition of the intestinal canal rather than to overproduction. The canal being so motionless below the stomach, the acid secreted in the stomach is not passed downward at a normal rate, and, therefore, cannot be neutralized by the alkaline secretions of the intestine, and is, therefore, present in excessive quantities.

When the patient is taken off the drug by the methods herein outlined, this excessive acidity is not at all apparent; in fact, there is more often a deficient secretion of hydrochloric acid than otherwise. In these cases hydrochloric acid is a remedy of the greatest value. It will enable the patient to take and digest a larger quantity of nourishment. It is antiseptic and opposes acetic, butyric, and lactic acid fermentation, and thereby prevents rather than causes a hyperacid condition of the stomach.

The hyperacidity, which is troublesome, is due to acetic, butyric, or lactic acid fermentation. Hydrochloric acid retards the development of or destroys these ferments and, therefore, prevents an acid stomach. This acid should be given in doses of about 5 minims of chemically pure acid in ¼ glass of water immediately before or immediately following the meal. A smaller dose than that does not meet the requirements in these cases.

HYPNOTICS.

Of the several hypnotics in common use the author has found veronal the most dependable, but there is a decided objection to its use in drug cases. While 7½ to 10 grains of veronal is probably the most reliable hypnotic which brings prolonged sleep, the fact that it is so abiding in its effects makes it objectionable. On the day following the dose there is a degree of lassitude and languor which is really distressing to the patient. Still in some cases a dose of veronal for one or two nights after the drug is withdrawn is not only allowable, but it may serve a very good purpose.

Trional and sulphonal in doses of 20 to 30 grains are reliable hypnotics in narcotic addiction cases. Their effects are not so prolonged as that of veronal; neither are they followed by so great depression.

It is the author's rule to discourage the use of hypnotics in all cases, but there are instances in which their use is expedient. However, he insists that it is much better for the patient to get along with three or four hours' sleep obtained without the aid of any narcotic or hypnotic than it is to have a longer sleep under the effects of any one of these remedies. Therefore, when a patient is getting as much as four hours' sleep out of each twenty-four hours no hypnotic is given. Under the

plan of treatment outlined in this work, it is rarely necessary to give hypnotics at all, as it is the exception for a patient not to sleep as much as four hours out of twenty-four.

ERGOT.

Ergot has been highly extolled by some for its effects in the treatment of narcotic drug addiction, but the author has been totally disappointed in this remedy. If the claim of Livingston, its chief advocate, that ergot has an elective action for any set of blood-vessels which is dilated, could be verified it would be a universal remedy for almost all diseases.

In every inflammatory condition the blood-vessels of the inflamed parts are excessively filled with blood. If ergot had an elective action that would contract these overfilled blood-vessels and restore equilibrium in circulation it would be almost a specific cure for many of the diseases we are called upon to treat. The author has tried this drug faithfully and has been entirely unable to verify these claims of Livingston; therefore, he has thrown it aside as of no value in the treatment of drug addiction.

If it has any effect at all it must be because it acts as a placebo upon the mind of both the physician and the patient. In that way, if the physician is sufficiently credulous and the patient is sufficiently responsive to suggestion, it might allay irritability of the patient and satisfy the mind of the physician, but no practical therapeutist can afford to depend upon a remedy the effect of which is so uncertain and disappointing as is that of ergot.

QUININE BY INUNCTION.

Among the complications to be guarded against is malaria. Drug habitués resist acute outbreaks of

malaria, but the system becomes infected with germs of the type which causes the chronic malarial manifestations, and when the drug is withdrawn they often give trouble, the symptoms being those usually dependent upon chronic malarial toxemia. In other cases an acute malarial attack similar to those which are known to be precipitated by a change of altitude will follow the withdrawal of the opiate. This should be watched for and upon its first appearance the patient should be saturated with quinine.

The author's eighteen years' general practice in a malarial climate led him to devise a method of introducing quinine into the patient's system which has served him a good purpose in the treatment of drug addiction.

Patients of this class do not take medicine by the mouth as well as the average person, and when medicines are given to them by the mouth an unfavorable impression is often made upon them; therefore, it is very convenient to be able to give them all the quinine that may be needed without encumbering their stomachs with it.

This can readily be done by inunction by giving the quinine dissolved in glycerin.

In the treatment of malarial diseases it frequently becomes a matter of importance to introduce quinine into the system by other routes than by the stomach, because the stomach may be so irritable that it will not retain it, or so disordered that it will not appropriate medicinal agents introduced into it. In these conditions quinine inunctions have long been resorted to, but it seems that little thought has been given to the mode of preparing quinine for this purpose.

The method almost universally employed is to mix quinine with lard or vaselin and rub the patient with it.

There is no doubt but that thousands of helpless children have been slain by the malarial germ while their physician stood by and credulously depended upon securing the effects of quinine by this impossible method. The same fatal results have often occurred in adult patients because of the failure of a congested stomach to absorb the quinine given by the mouth.

The principles involved in the successful administration of any substance by inunction are that the remedy must be soluble in the medium employed, and the compound, when completed, must have such chemical affinity for the blood as to induce osmotic action when applied to the skin, or have such physical properties as to admit of being forced through the skin by mechanical pressure.

None of the salts of quinine are soluble in lard or vaselin, and it is certain that these substances have no chemical affinity for an alkaline watery solution like the blood. Crystalline substances do not admit of being forced through the skin mechanically; therefore, it would seem quite unreasonable to undertake to administer quinine by inunction in such a medium. Lanolin is better, because it is more miscible with the blood, and when inunction is to be carried out simply as a mechanical process, as in the use of mercury by inunction, it is an ideal medium, but it is not a satisfactory medium for quinine inunction, because quinine is not soluble in it, and crystalline substances cannot be made to pass through the integument unless they are in solution.

There is, however, a medium in which some of the salts of quinine may be administered by inunction with perfect success. It is glycerin.

The muriate and bisulphate of quinine are readily soluble in warm glycerin in the proportion of 1 part of quinine to 3 parts of glycerin, thus making a 25 per

cent. solution of quinine. The glycerin of this compound has such an affinity for the water of the blood that it passes readily through the integument and carries with it the quinine which it holds in perfect solution. Neither the sulphate nor bromide of quinine are soluble in glycerin; therefore, they are not fit to be used in this way.

In the more severe forms of pernicious malarial diseases, if quinine is administered by the stomach, rectum, or even hypodermically, the absorbents may be so deranged that they will not take it up, but so long as the blood is circulating, if one of the soluble salts of quinine be dissolved in glycerin and applied to the skin, it will pass into the blood, the skin acting merely as a dialyzing membrane.

This is essentially a chemical process, and its success does not depend upon the activity of the secretions or, in fact, of any of the vital functions except the circulation of the blood. A patient can be quininized as promptly and as thoroughly by inunction with this glycerole of quinine as by any other mode of administration, and it is certainly much to be preferred to the hypodermic method. In fact, the author has no hesitation in saying that the patient can be more quickly and more certainly quininized by this form of inunction than by any method except the intravenous method, and that is hardly to be thought of as a mode of administration of quinine.

This mode of administration of quinine is suitable for either adults or children; but in estimating the dose, allowance should be made for waste, because some may be wasted by contact with the clothing before all the compound has been taken up. A convenient form of ordering this compound is:—

℞ Quinine muriate ..... 3ij.
Glycerin (warm) ..... 3viij.
M. et ft. sol. Sig.: Use 3ij as inunction for adult.

If quinine is given hypodermically the injection irritates the site of injection, causing more or less tumefaction. The tumefaction retards the absorption of the solution, and often, especially in pernicious types of malaria in which there is poor capillary circulation, by cutting down on the site of the injection, crystals of quinine may be found several days after the injection. It is evident that this quinine lying in the cellular tissues has no effect on the malarial germs in the patient's blood.

When quinine is indicated at all, in a drug habitué or any other malarial case, a quantity sufficient to destroy the life of the malarial germ should be introduced into the blood by the quickest method available. This can be done in thirty minutes' time by the author's inunction method.

Twenty grains of quinine, when actually introduced into the patient's blood, is an effective dose. To be certain to get that quantity into the circulation with promptness, 30 grains of the muriate or bisulphate should be dissolved in 1½ or 2 teaspoonfuls of glycerin and this rubbed into the patient's skin, applying it to the abdomen, and to the inner aspect of the thighs and arms. A moderate degree of friction should be used in applying this, and it should be continued until all the glycerin has disappeared from the surface. Ten to fifteen minutes is long enough to keep up the friction.

The hygroscopic nature of the glycerin, its affinity for the water in the moving stream of blood, causes it to pass readily through the skin into the blood. The stimulation of the capillary circulation by the friction hastens this process.

Drug patients coming from a malarial district during the latter part of the summer or early fall months should be quininized as soon as they are taken off the drug, thus forestalling the development of malarial complications. A full dose of quinine (20 to 30 grains) given at bedtime by inunction has a very happy effect on those patients.

Quinine in full doses is antipyretic and, therefore, sedative, and a patient often secures a full night's sleep from the effects of a full dose given at bedtime, but if it is attempted to quininize the patient by the administration of small doses by the mouth the nervousness, temperature, and discomfort of the patient will be markedly increased.

The antipyretic effect of quinine persists for twenty-four hours or more and does much to overcome any aching of the limbs or back from which the patient will certainly suffer if he has a chronic malarial infection. It can be used at times in drug patients with distinct benefit, even where there is no malarial complications present, this being due to its prolonged antipyretic effects.

CHAPTER XI.

PHYSICAL TRAINING.

THE fact that drug users who have been taken off a drug by a physiological course of treatment take on flesh at a rapid rate during convalescence, and the importance of having that newly acquired flesh developed into firm muscular fiber, leads the author to include a chapter on Physical Training in this work.

The author does not claim any special fitness to write on such a subject, but with the hope of assisting others and of giving this feature of the management of convalescent drug patients the notice it deserves he here undertakes to present some measures which he has used to great advantage.

The ideal condition, that under which the most satisfactory results can be obtained, is to have a well-equipped gymnasium connected with the institution where drug and alcohol patients are treated and to require patients who are in a suitable stage of convalescence to spend several hours each day in games and exercises under the supervision of a competent physical director. These facilities are not available in many instances; therefore, the author suggests measures which can be carried out in the patient's room.

Dumb-bells, heavy weights, or horizontal bars cannot be used to advantage with this class of patients. Such forms of exercise are too violent and involve the use of more strength than such patients have. A course of training based upon muscular resistance, antagonizing one set of muscles by another, is best suited for use in the patient's room. Such a course of training is based

upon physiological laws, to which the author wishes to call attention in this connection.

The nutrition of the body takes place, mainly, in that invisible space between the termination of an arterial capillary and the beginning of a venous capillary. As the arterial capillaries diminish in size, the quantity of blood which they allow to pass at one time grows persistently less until finally the capillary is of such small caliber that only one blood-corpuscle can pass through it at a time. At this location, a string of red and white blood-corpuscles passes along the course of the capillary, one behind another. This continues until the veins are entered, and as the veins gradually increase in size the blood-corpuscles double up, getting two by two, and three by three, and so on until the blood-current is again of considerable volume, and then it is carried to the heart.

In that space between the termination of an arterial capillary and the beginning of a venous capillary, the blood-corpuscles come in direct contact with the cell tissues of the body. These parts are universal; that is to say, all parts of the body are so fully supplied with blood-vessels that there is no particular spot at which this condition of affairs does not exist.

Any course of exercise which will increase the activity of the capillary circulation increases the nutrition of the part. A sluggish circulation in any organ or part results in a poorly nourished organ, or if the entire circulation is sluggish the body is poorly nourished. An active, vigorous circulation, especially an active capillary circulation, insures increased nutrition throughout the body.

When we consider the forces which govern the circulation of the blood, it is easy to understand how the

heart, acting as a force pump, can throw the blood to the most remote parts of the body. But when the forces which return the blood to the heart are considered, we find that they are nothing like so positive. In fact, it is rather difficult to explain how it is that the several forces concerned in returning the blood to the heart are of sufficient potency to be equal to that task.

Among the forces which aid in bringing the blood back to the heart is the pumping effect of the diaphragm. This, operating as suction pump, lifts the blood from the lower extremities, bringing it into the vena cava and back to the heart. But although this is one of the forces, it is not the principal one which brings the blood from the exterior of the body into the center.

The principal force upon which the return of the blood to the heart depends is the rhythmic contraction of the muscles lying alongside of the veins, and in which the capillaries are imbedded. It is the tonic state of the muscles which lie alongside of the veins and venous capillaries which supports them, and by their contraction urges the blood toward the heart.

The arterial capillaries have a muscular coat, which under the influence of the nervous system is capable of contracting or relaxing, regulating the caliber of those vessels, but the veins have no such important muscular element in their walls. They are more like elastic tubes than real muscular structures, but they are so imbedded in, and surrounded by, muscular tissues that all parts of the veins and various capillaries are well supported by the contraction of these outlying muscular tissues.

If the muscles are flabby and relaxed they do not give the veins the degree of support they require to enable them to maintain the weight of the column of blood or to urge it on back to the heart.

The muscles in a normal condition are in a constant state of alternate relaxation and contraction. This is not perceptible to the naked eye or to the individual himself; nevertheless, it is true. This alternate relaxation and contraction of the muscles, especially the contraction of the muscles, forces or urges the blood onward to a larger part of the vein. As the blood in a vein, under such pressure, travels in the direction of the least resistance, it is necessarily urged toward the heart, that being at the larger end of the veins.

In the course of physical training herein outlined, this element of muscular tension, or muscular contraction, is voluntarily increased. Instead of depending upon the rhythmic, intermitting contraction of the muscles, the set of muscles to be developed are put under tension by direction of will, and this tension is kept up for about ten seconds before a period of relaxation is allowed. The tense contraction of the muscle squeezes the venous blood out of the contracted muscle and urges it on toward the heart.

This state of tension is allowed to pass away and a state of relaxation is established in its stead, when the heart, with its pumping force, rushes a new supply of arterial blood to these structures. The part is again put under tense muscular contraction and this blood is in turn squeezed out of the muscle and passed on toward the heart, making room for a new influx of blood.

This insures a more rapid interchange of blood in the part which is being exercised, and this more rapid passage of blood through the part, accompanied by the nutritive changes which such improved circulation involves, develops the part which is being exercised.

In the use of dumb-bells or other weights, gravity is the force which carries the weight downward, and the

contraction of the muscles which are made to lift the weight is the force by which gravity is to be overcome. This leads to the development of the flexor muscle, but no effort is required on the part of the extensor muscles to allow the weight to descend toward the earth; therefore, those sets of muscles do not receive the same degree of development.

The dumb-bell system of exercise develops the body in a disproportionate manner, developing the flexor muscles, but leaving the extensors undeveloped.

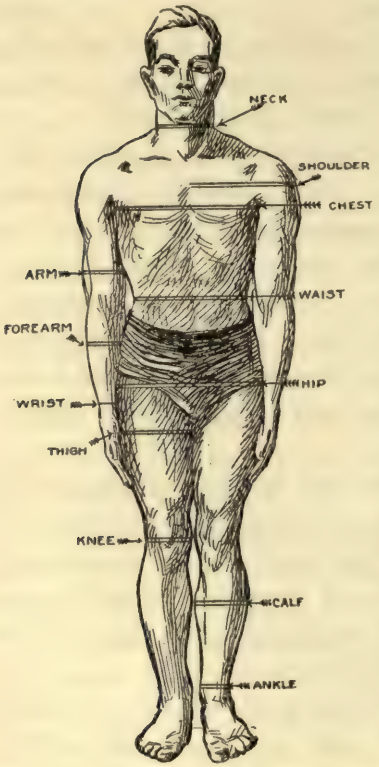
Heavy weights overtax the heart and blood-vessels by the constant contraction which handling them involves, but, by making the contraction intermittent, by means of alternate relaxation and contraction, the circulation of the blood is not obstructed. On the contrary, with each relaxation the blood flows from the artery into the capillaries and with each contraction it is forced from the capillaries into the veins and helped in its course toward the heart.

Before beginning to take any kind of a course of physical training, the patient should be examined to ascertain the condition of the heart. If a structural lesion is present, the course of exercise should be so modified as not to put undue strain upon the heart or to otherwise overtax the strength of the patient.

Careful measurements of the body should be made in order to ascertain what parts are most deficient in development and the course of exercise should be so regulated as to devote more time to the development of these defective parts. The weight, height, and measurements of the body of the patient should be recorded at the beginning of the course of training and the patient should be reweighed and measured about every ten days. The comparison of these records, one with the other,

indicates the progress that is being made, and, as the improvement of the patient can usually be verified by the scales and the tape line, these give substantial grounds for encouragement.

The following measurements should be taken and recorded:—



Date .....
Name .....
Weight .....
Height .....
Age .....

1. Girth of neck.
2. Girth of shoulders.
3. Girth of chest, natural.
4. Girth of chest, contracted.
5. Girth of chest, expanded.
6. Girth of right upper arm.
7. Girth of left upper arm.
8. Girth of right forearm.
9. Girth of left forearm.
10. Girth of waist.
11. Girth of hips.
12. Girth of right thigh.
13. Girth of right calf.
14. Girth of left thigh.
15. Girth of left calf.

The position of these measurements is indicated in illustration.

That there may be a standard with which the measurements of the patient under consideration can be compared, the following tables are given:—

TABLE REPRESENTING THE POPULARLY ACCEPTED PROPORTION FOR ADULT MEN.*

Height.	Weight.	Neck.	Chest.	Biceps.	Forearm.	Waist.	Thighs.	Calves.
5 ft.	103–107	11⅛	33	Same as neck.	8⅞	29	17	Same as neck.
5 ft. 1 in.	107–111	11½	34		9¼	29½	17¼	
5 ft. 2 in.	111–116	12	35		9⅝	30	17½	
5 ft. 3 in.	116–121	12½	36		10	30½	18	
5 ft. 4 in.	121–127	13	37		10⅜	31	18½	
5 ft. 5 in.	127–133	13½	38		10¾	31½	19	
5 ft. 6 in.	133–140	14	39		11⅛	32	19½	
5 ft. 7 in.	140–147	14½	40		11½	32½	19¾	
5 ft. 8 in.	147–155	15	41		11⅞	33	20	
5 ft. 9 in.	155–164	15½	42		12¼	33½	22	
5 ft. 10 in.	164–174	16	43		12⅝	34	23	
5 ft. 11 in.	174–185	16½	44		13	34½	24	
6 ft.	185–200	17	45		13⅜	35	24	

*Taken from "Physical Training," by Albert Treloar.

Women, as a rule, come closer to the ideal figure than men in all particulars, except the waist. The unsightly notch in the side contour of many women at the waist is, no doubt, due to the corset and lack of exercise. Following are the measurements of six New York artists' models, supposed to have figures practically corresponding with the classical ideals:—

TABLE REPRESENTING IDEAL PROPORTION FOR WOMEN.*

Height.	Age.	Weight.	Wrist.	Forearm.	Arm, straight.	Calf.	Thigh.	Hips.	Waist.	Chest.	Neck.
5 ft. 3 in.	20	106	5⅝	8¼	9½	12¾	20¾	33½	24	31	13
5 ft. 4 in.	19	107	6	8½	9½	12	20	32	22½	30	12
5 ft. 4½ in.	24	130	6	10	10½	13	22	36¾	25	32	12¾
5 ft. 5 in.	25	138	6	10	11	14	23	38	26	33	13
5 ft. 6 in.	23	140	6	10	10½	14½	25	40	25	34	13
5 ft. 8 in.	27	165	6¼	11	12½	15½	27	42	31	35	14½

*Albert Treloar.

After having made the physical examination and the measurements above indicated, the patient may be started on the course of exercise, being guided as to the amount and character of exercise by the information gained from the measurements and examination.

When no special defects are revealed by the measurements and examination, but where these only show general deficiency, extending practically to all the muscular structures, the author thinks it best to begin with the movements indicated by the following cuts, Nos. 1 to 8, inclusive, and to practise these for a week or ten days before undertaking a larger number of exercises.

TIME FOR TAKING EXERCISES.

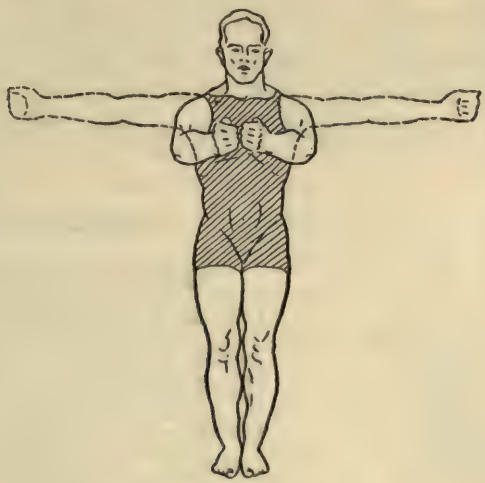
The hours at which the exercises should be taken will depend upon the hours at which the meals are taken. The exercises should not be taken during the time in which stomach digestion is in active progress. Since it requires about three hours for the digestion of a meal, the exercise period should be as much as three hours after each meal.

Usually our meals are taken at about 7 A.M., at noon, and at 6 P.M. If the patient is quite weak and therefore not able to take much exercise at any one time, it is best to have four exercise periods per day. One about an hour before each meal and one at bedtime, say, 6 and 11 A.M. and 5 and 9 P.M. These periods should vary in length from fifteen to forty-five minutes, according to the strength of the patient. They should not be so long as to bring the patient to a state of severe fatigue, but the exercise should be regulated so as to be as vigorous and should be continued for as long a time as the patient can stand without severe fatigue.

The best results can be obtained only when a cold sponge bath is taken following each period of exercise; this certainly should never be omitted following the early morning and night exercise period. A shower bath followed by brisk rubbing is better.

EXERCISE No. 1.

Stand erect as indicated by Cut 1. Extend the arms to the side, full length, level with shoulders; close the



Exercise No. 1.

fists, and make all muscles of the arms, forearms, and shoulders rigid, and, with the muscles of the back of the arms and shoulders, make a determined effort to hold the arms in the position assumed, but with the flexor muscle reinforced by the will. In spite of this resistance, bring the arms together as indicated in the cut. Let this movement be made very slowly and with the greatest possible effort. After the hands have been

brought together, arms straight in front, relax the tension and restore the arms to the position from which the movement was started. Allow this period of relaxation to continue for as great a length of time as was consumed in bringing the arms together under tension; then repeat the movement, and continue to repeat it with alternate tension and rest until it has been made 12 times. Do not forget that in making this or any other movement the more rigid the muscles are made, and the greater the degree of resistance to the movement to be made, the more benefit will result. The tense contraction of the muscle overcomes venous stasis, forces the venous blood out of the part, and then the period of relaxation allows the heart to fill the part with a fresh supply of arterial blood ready to give off its nutrient elements.

Exercise No. 2.

EXERCISE No. 2.

Assume position shown in Cut 2, hands resting on hips. Make muscles of arms and shoulders rigid and then force elbows to the rear as far as possible. Maintain that position about ten seconds; then relax; return to first position, and after a moment's pause repeat. As the arms are forced backward, take a deep breath, filling the lungs as fully as possible, and expel this air as the arms are brought back to the position of starting. Repeat 20 times at each exercise period.

EXERCISE No. 3.

This exercise consists of the imaginary lifting and lowering of a heavy weight. Flex the right arm as shown in cut and make muscles rigid, and with the muscles on the back of the arm endeavor to hold it in that position, but in spite of that resistance force the arm to a perpendicular position above the head, keeping the muscles as rigid as possible. When this position has been reached, instead of holding to the idea that you are lifting and holding up a heavy weight, reverse the thought to the idea that you have taken hold of something that must be pulled down, but the fact that it is very difficult to move requires the use of all the force at your command to pull it down. Persist in that effort with that idea until the arm has been brought down to position it occupied at the beginning of this movement. The entire time consumed in forcing the arm up and bringing it down should be ten to twelve seconds. The tension should then be relaxed; the arm dropped to the side and allowed to rest while the same movements, with the same ideas in mind, are made by the left arm. These movements should be repeated twelve times with each arm at each exercise period.

Exercise No. 3.

Exercise No. 4.

EXERCISE No. 4.

This exercise consists in bending the body from side to side, and is not strictly a resistance movement, but it is valuable in developing the muscles of the back, sides, and abdomen. It is also a form of abdominal massage and promotes peristalsis. Assume erect position; place hands on hips, and then bend the body to one side as far as can be done without losing balance. Hold in that position a few seconds; then bend to the other side. Repeat this movement 20 times.

EXERCISE No. 5.

Exercise No. 5.

This exercise loosens up and develops the muscles of the shoulders, back, sides, and front of chest. It is also a deep-breathing exercise and if properly used increases the ability to expand the chest. Stand erect with arms resting by sides and raise shoulders as high as possible, and as this is being done inflate the lungs to their utmost capacity. Make the muscles on the back of the shoulders rigid, and put all effort possible into the movement. When the shoulders have been forced to as high a point as possible, maintain that position a few seconds; then relax the muscles and depress the shoulders to as low a point as possible,

at the same time expelling the air from the lungs. Repeat this movement 20 times.

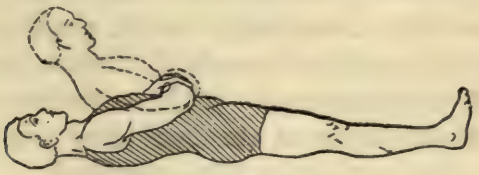
EXERCISE No. 6.

Exercise No. 6.

Assume upright position as shown in cut; make muscles of the neck rigid; turn face to one side as far as possible, and endeavor to hold that position, but in spite of that effort slowly twist the neck so as to turn the face to the opposite side, holding the muscles rigid during the entire turning movement. After the face has been turned to the opposite side as far as possible and this state of rigidity has been maintained for about ten seconds, relax and allow a period of relaxation to continue for about the same length of time; then repeat the movement. Repeat 20 times.

EXERCISE No. 7.

Lie on back on floor or other firm place; clasp hands across stomach; then bend head and shoulders up as far



Exercise No. 7.

as possible, bending in the neck, shoulders, and upper part of the body only, but not at hips. Inflate the lungs

as fully as possible before beginning to bend upward, and as the shoulders are brought forward and upward expel the air from the lungs; at the same time compress the lower part of the chest with the elbows and arms, thus expelling as much of the residual air from the lungs as possible. When the body has been bent to as high a point as possible and held in that position a few seconds, lower the head and shoulders, slowly, to the horizontal position. As this is reached, take a deep breath, inflating the lungs to their utmost capacity. Expel this air and inflate again. Do this three times, and then repeat the movement, bending up as in first instance. This movement taxes the strength considerably, and it is best not to use it more than 8 to 10 times at the beginning, but the number of movements should be increased from day to day until 20 to 30 are reached. This is a good breathing exercise and strengthens all the muscles of the upper part of the body, especially the abdominal muscles.

EXERCISE No. 8.

Lie, face down, on a rug on floor or other firm place; place hands in position shown in cut. Make entire body rigid and raise upward to position indicated by dotted lines; hold this position for about ten seconds, the weight of the body resting on the hands and toes, all muscles being rigid; then lower body to first position, relaxing only when that position is reached. Rest a few moments and repeat the movement. This movement should be made about 10 times at the beginning and increased from day to day until 20 to 30 are reached.

By the time the foregoing eight exercises have been carried out faithfully at each exercise period for a week or two weeks, the strength will have usually increased

sufficiently to allow the addition of a few more movements. All or a part of the seven movements, next described, should then be added, and these should be practised in connection with the eight first used. It is best to practise the newly added movements first, and then go over those to which the patient has become accustomed.

If it is found that the carrying out of all the exercises at one time fatigues the patient unduly, a period of rest

Exercise No. 8.

of a quarter of an hour or half an hour should be allowed and then the exercises resumed. In this particular, exercises for convalescents differ from exercises for those who are already in a fair state of health, and who can only spare short intervals from their daily vocation to devote to physical development. The convalescent has nothing else to do and can devote all the time that can be used to advantage to the development of strength. If he is only able to carry out a few movements at first, and to do that very imperfectly, let that much be done and persisted in until the strength thus acquired will enable him to do more; then add such other movements as his strength will permit.

Exercise No. 9.

EXERCISE No. 9.

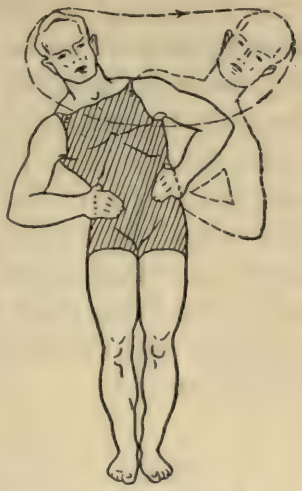
Assume upright position as shown in cut, and place hands on hip; then circle head round and round, bending neck as far as possible in every direction, making as large circle with the movement of the head as possible. Circle in one direction 5 times around and reverse. Continue this alternate circulating of the head, first in one direction and then the other, until 30 circles have been made, 15 times in each direction.

EXERCISE No. 10.

Assume standing position with the hands resting on hip; then bend neck forward as far as possible and then backward as indicated in cut. Make muscles of the neck rigid, and hold them so while bending in one direction and relax as the motion is made in the reversed direction. Do this 15 times at each exercise period.

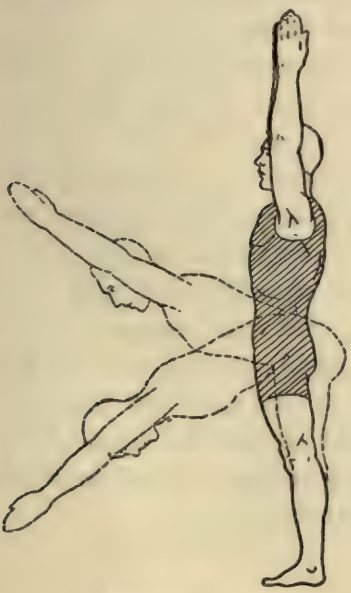
Exercise No. 10.

EXERCISE No. 11.



Exercise No. 11.

Assume upright position, with the hands resting on hip as indicated in cut; then circle body, bending at waist as far as possible. Make as large circle by movement of the shoulders and head as possible, but do not bend below hips. This circle should be made in one direction 5 or 6 times; then the motion should be reversed. Circles alternating to the right and to the left should be continued until 30 movements of this kind have been made.

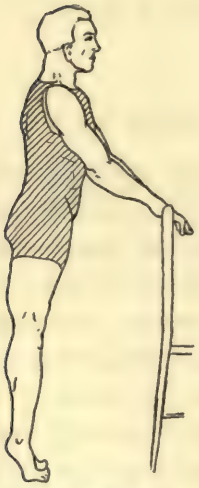


Exercise No. 12.

EXERCISE No. 12.

Assume upright position as indicated by cut and raise the hands perpendicularly above the head, arms together. Then while holding hands and arms in same relation to the body and head, bend forward as indicated by dotted lines. This is a motion made by bending at the hips, but not of any other part of the body. Bend forward as far as possible, but do not allow position of the

arms to change in their relation to the head. After bending forward as far as possible, then, without dropping arms or changing their position at all, raise up to the position from which you started. Make the muscles of the abdomen very rigid on the upward movement and hold them so until the first position has been reached; then relax. Rest about ten seconds between the movements and then repeat as in the first instance. This movement strengthens both the muscles of the back and abdomen, and should be made about 10 times at each exercise period.



Exercise No. 13.

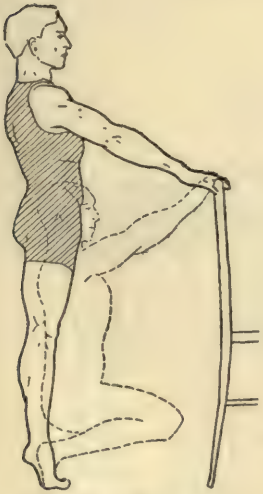
EXERCISE No. 13.

Assume upright position with the hands resting on back of chair or some other object to steady the body; then raise on toes as high as possible, as shown in cut. Make all the muscles of the lower extremities rigid. Remain in this position about ten seconds; then relax and come down until the feet rest flatly on the floor. Allow about ten seconds' rest and then raise on the toes again. Keep muscles rigid as long as you are standing on the toes, but relax entirely when the body is lowered so that the soles of the feet rest on the floor. This movement should be made from 10 to 20 times at each exercise period.

EXERCISE No. 14.

This is directly the reverse of exercise No. 13, that is, the weight is balanced on the heel with the toes raised from the floor. Stand on the heels ten seconds, making all of the muscles of the legs rigid during that time; then relax, bringing the toes down for about the same length of time. Repeat this movement about 20 times at each exercise period.

Exercise No. 14.



Exercise No. 15.

EXERCISE No. 15.

Balance weight on toes as indicated in cut, and then lower the body to squatting position, all the time maintaining balance on toes. Remain in this position a few seconds and then raise to upright position. Repeat this 15 times at each exercise period.

Exercise No. 16.

EXERCISE No. 16.

Stand in erect position and lock hands on back, resting on the small of the back; then make all the muscles of the arms rigid, and, while holding in that rigid state, lower the hands as far as possible, as indicated by dotted lines in cut. Do this 15 times at each exercise. Keep the muscles rigid on the downward movement only, allowing a period of relaxation of about ten seconds between each of these movements.

EXERCISE No. 17.

Assume upright position with hands on hip; then bend the body forward as far as can be done without moving the legs; then bend backward as far as possible without losing balance. This movement should be made about 15 times at each exercise period.

Exercise No. 17.

EXERCISE No. 18.

Exercise No. 18.

Assume upright position with the hands and arms held downward, forward, and to the right; then bend body to the left side and from that position bend as far to the other side as possible, swinging the hands and arms in the opposite direction at each movement of the body. This is a motion of the body and arms only. The legs should be kept still. Bend just above hips and in the shoulders; swing the body from side to side. This movement should be made about 15 times at each exercise period.

Exercise No. 19.

EXERCISE No. 19.

Assume upright position; then step off with right foot a full step; spring forward and downward, throwing the weight on the right foot, holding all the muscles of the lower extremities rigid. Stand in this posi-

tion about ten seconds; then assume upright position again, relaxing all muscles as much as possible as that position is assumed. The arms should be held in front as the movement is begun, and swung out to each side at level with the shoulders as the forward position is taken. This is indicated by dotted lines in the cut. Repeat this about 10 times at each exercise period.

Exercise No. 20.

EXERCISE No. 20.

Assume upright position; bend body forward, hands down and arms together. Then forcibly raise arms upward and backward as far as possible. Repeat this movement 10 to 15 times at each exercise period.

EXERCISE No. 21.

Lie on the floor on a rug, with the knees drawn up, the legs and thighs forming a right angle. Then raise

Exercise No. 21.

the body so that the weight will rest on the foot and head, bringing the body up as high as can be done in that position. This position is indicated by dotted lines

in cut. Repeat this 10 times. When the body is brought upward and is resting on the feet and head only, all the muscles of the body should be made as rigid as possible and held so for about ten seconds; then a period of relaxation should be allowed, in which the body is brought down so as to rest on the floor as at beginning.

EXERCISE No. 22.

Lie on the floor on a rug; place hands under head; then raise to sitting position. If it is difficult to do this

Exercise No. 22.

without something to keep toes and feet from raising, let the toes be placed under some article of furniture so that they may be held down. This exercise should be repeated about 10 times at each exercise period. After the body has been raised to erect position, it should be lowered to horizontal position, but the body should be lowered gradually and not allowed to fall back suddenly. Continue to hold muscles of the body tense during the time the body is being lowered, and then relax; allow a short period of rest; then repeat movement.

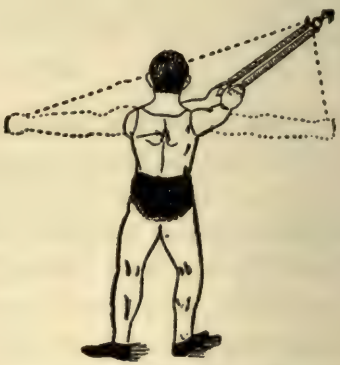
The author has found it very difficult to keep patients interested in their physical development to such a degree as to secure satisfactory results. In some cases it has

been found that some simple device will stimulate their interest and lead them to continue their work.

In such cases "the simplex exerciser," shown in the following cuts, has been found satisfactory. It is an inexpensive and convenient device; may be fastened by screw hook to window casing and mop board. By its use in the seclusion of patient's own room he can get all the exercise he wishes.

The following cuts show its use. Many movements not here shown can be added. By its persistent use, any part of the body can be developed. It may be used to advantage in connection with any or all the exercises above shown.

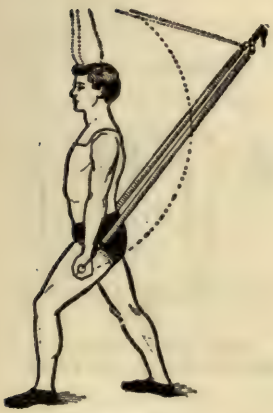
DEEPENING THE CHEST
Arms from Front above Head



CHEST DEVELOPMENT
Hands from front to level with shoulders

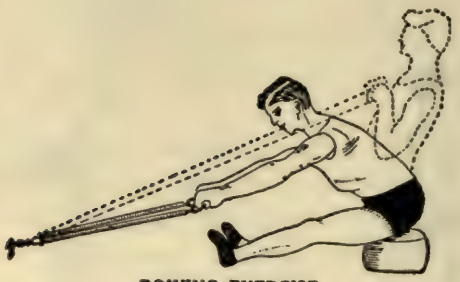
Large muscle front of thigh.
Rise from crouching to erect position.

STOMACH EXERCISE
Keep Knees Stiff



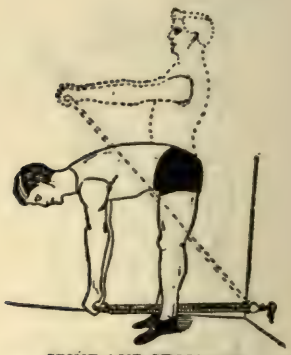
Broadening the Chest
Hands up Sideways

BOWLING
Step out with Left leg



ROWING EXERCISE

Hands from front of body to back



SPINE AND STOMACH
Body from Bent to Erect Position

CHAPTER XII.

DIET DURING CONVALESCENCE AND AFTERWARD.

DIET, the quantity and quality of food which will nourish the body to the best advantage, is a matter of importance to every person, but to those who are convalescing from some protracted ailment such as drug disease it is of greater moment than to persons who are already in a fair state of health.

Almost all convalescent patients have a tendency to eat too much. While this is true of most persons in apparent health, convalescents do not bear these excesses as well as do stronger persons. Those convalescing from narcotic drug disease seem to be more unfavorably affected by excesses in diet than any other convalescents, and this idiosyncrasy continues in them for months, if not for years, after they have in every other respect recovered from drug influences.

In such persons excesses in diet bring on suffering that simulates in many respects, and strongly reminds them of, the distress they experienced when they were making an effort to reduce the quantity of drug they were using, or when they were making an effort to leave it off altogether. The suffering in both instances arises from the same cause—toxemia.

The system of a person habituated to a narcotic drug is in a state of chronic toxemia. This makes the anesthetic and narcotic effect of the drug to which they are addicted necessary to their comfort, because without it the nervous system rebels so strongly against the presence of the toxins that they are in constant distress.

When the quantity of drug they are accustomed to take is reduced or discontinued, the nervous system at once becomes sensitive to the irritating effect of these toxins and this brings on suffering of various kinds.

The suffering is first noticed as pains about the abdomen, head, back, and lower extremities. The longer the taking of the dose is deferred, the more severe this suffering becomes. Most persons who are habituated to the use of an opiate make efforts to go for a longer period without taking the accustomed dose. With the system in the toxic state usual to such persons, these efforts at abstinence are attended by suffering, which always forces a return to the drug.

After a patient has been taken off an opiate, excess in eating causes acute toxemia, and that is attended by suffering very similar to that which was formerly experienced by such person when trying to do without the drug. Excess in diet, with the resulting toxic state incident thereto, revives the memory of this former suffering, and this unnerves the patient to such a degree that he does not bear the suffering incident to such toxic state with reasonable fortitude. Palliatives for relief are early sought and they may be ruinous.

The fact that such acute toxic state brings on suffering that so closely simulates the suffering from chronic toxemia, to which the patient was formerly exposed, makes it necessary for one who has had such an experience to be doubly guarded about his diet.

It is evident that all persons who have been addicted to narcotics or alcohol should live on a low calorie diet, and that they should almost, if not entirely, exclude red meat from their diet list.

There is no question but that eating lean meat, red meat, in the quantities usually taken greatly overtaxes

the eliminating organs and leaves a residue of toxic matter in the system. Meats are classed by all physiologists as a stimulating diet. One who has gone to excess in the use of stimulants should carefully avoid a stimulating diet as well as all other forms of stimulation. Only such quantity of proteid food should be taken as is actually necessary. Any excess results in intestinal toxemia, with its attendant dangers.

Food substances are divided into three classes, known, respectively, as proteids, carbohydrates, and hydrocarbons. The first of these in chemical composition consists of the elements carbon, hydrogen, oxygen, and nitrogen. The second class contains carbon, hydrogen, and oxygen, while the third class contains only carbon and hydrogen.

Food of the three classes above mentioned is necessary to keep the body in perfect condition, but these substances should be taken in the proportions required by the system and not merely to satisfy a cultivated appetite. An excess of proteid food, however, is much more hurtful than an excess of either of the other classes. It has been shown by careful physiological experiments that from 3½ to 4 ounces of proteid food per day is all that the system requires and is all that it will appropriate. When the daily intake of food contains a larger quantity of proteid than that, the excess undergoes putrefaction in the intestine, toxins are generated from it, and, these being taken into the blood by absorption, interfere with the proper working of all the organs.

The best results are obtained in convalescent drug patients by arranging their meals so that all the animal food, food consisting principally of proteids, is taken at one meal, the principal meal of the day, while the other two meals are composed of vegetable matter. The

animal food, especially meat, eggs, and sweet milk, is digested in the stomach and requires much longer time for complete digestion than food of either of the other classes. If these articles or either of them are taken at one meal and excluded from the other two meals, the stomach is not taxed with so many hours' work as it would be if proteid food were taken at each of the three meals. If animal food rich in protein be taken at each of the three meals, the stomach is called upon to do about nine hours' active work each day. The stomach is not stronger than any other organ in the body or than the body as a whole. If the patient was called upon to do nine hours' work of any kind per day he would not be able to do it. Neither should the stomach be expected to work so many hours. All the proteid food that is required per day can be taken at one meal; it is much better to arrange the meals so that that will be done.

The carbohydrates and hydrocarbons do not undergo digestion in the stomach or particularly tax that organ. They are macerated and dissolved there, but are digested by the pancreatic and hepatic secretion, with which they come in contact in the duodenum and liver. Their digestion is strictly a chemical process and is almost instantaneous. Their digestion taxes the digestive organs much less than does the digestion of proteids.

The following is an ideal dietary list for a convalescent drug patient of average strength:—

For Breakfast.—An orange or a baked apple, a bowl of oatmeal or breakfast food with sugar and cream, one biscuit with butter, or two pieces of toast with butter and one glass of buttermilk.

For Noon Lunch.—A plate of soup, one baked potato with butter, a glass of buttermilk, one piece of pie.

For 6 p.m. Dinner, the Principal Meal.—Two eggs; two individual dishes of vegetables, which may consist

of either baked or green beans, potatoes, peas, turnip salad, spinach, okra, onions, or other such dish. One glass of sweet milk, ice-cream and cake, or other ordinary dessert.

It will be noticed that neither meat, coffee, nor tea are included in this list. The author is fully convinced that better results are obtained when these three items are entirely excluded from the patient's diet than when they are taken.

It has been contended that the appetite is a safe guide to the taking of food, but with this contention the author cannot agree.

Appetite is a creature of cultivation and grows by what it feeds upon. One may cultivate an appetite for almost anything and to almost any degree. Such an appetite often is of such impelling nature as to demand the taking of excessive quantities of food, but this is no index to what the system requires to repair the waste or build up tissue. The majority of people are completely enslaved by their appetite and habitually take from two to four times as much food as their systems require.

Appetite that has not been abused is doubtless a fair index to the needs of the system, but the appetite of the average person, perverted by cultivation and excess as it usually is, is no more a safe guide to what the system requires in the way of nourishment than feeling is a safe guide to conduct in any other line. Anyone who follows his feelings instead of his judgment is led into innumerable errors. This is equally true of one who eats to satisfy a cultivated or perverted appetite.

When the appetite has not been abused, or an artificial appetite created by overindulgence, it may be followed with comparative safety, provided the food to satisfy it be taken slowly and be thoroughly masticated.

Rapid eating, with incomplete mastication of the food, always leads to the taking of more food than is required before the appetite is satisfied.

The following, by Hancock,[1] is so appropriate in this connection that the author takes pleasure in quoting it in full:—

"There are many arguments pro and con as to the use of meat in the dietary. Chemically we know that meat contains no nutritive properties that are not found in vegetable foods. 'Conservative' physiologists contend that in meat we have all of the virtues of vegetables in a form more easily assimilable in the system. The retort to this is that in eating meat we get our nutriment at second hand, instead of at first hand, as in eating vegetables, and that meat food is harmfully stimulating. The tide of physical culture is setting strongly away from meat as an article of food.

"Food is required to supply in the body material for repair of tissue, heat with which to maintain life, and energy for muscular exertion. Chemistry has been made to demonstrate that all foods may be divided under three important heads:—

"*Protein.*—This comprises the chemical element in food, which, with mineral salts, is used to build up the tissues of the body. The proteids are nitrogenous foods, that is, nitrogen enters into their composition. Examples of the proteids are casein, myosin, gluten, legumin. Among the nitrogenous foods are the albuminoids, of which gelatin is an example. The proteids, water, and mineral salts will maintain life without the aid of the two kinds of food that are now to be enumerated.

"*Carbohydrates.*—Starch and the various sugars.

"*Fats.*—Vegetable oils, animal fat, butter, etc.

"While the proteids not only build up tissue (with the aid of water and mineral salts), but also supply some heat and energy,

[1] "The Physical Culture Life," Hancock. G. P. Putnam's Sons, New York.

it is the direct work of the carbohydrates and fats, which do not build up tissue, to supply heat and energy. This the carbohydrates do directly, while fats are stored up in the system to conserve heat and energy until they are needed. While proteids will furnish heat and energy as well as tissue, the ingestion of carbohydrates and fats saves much of what would be otherwise a drain upon the proteid-tissue supply.

"The ideal diet, then, must contain sufficient of the proteids to repair all waste of tissue and to build up increased amounts of tissue when needed, and enough of the carbohydrates and fats to meet all demands for heat and energy and to store up a reserve in the body until demanded. It is important, therefore, that proteids, carbohydrates, and fats should be taken in the proper proportion.

"What are these proper proportions? The most important elements supplied by the foods are the nitrogen in the proteids, and the carbon in the carbohydrates and the fats.

"Physiologists have been wont to contend until very recently that about 20 grammes of nitrogen are needed in the system in the twenty-four hours. As protein is 16 per cent. nitrogen, this would mean the daily intake of about 125 grammes of protein. An ounce is equal in weight to about 30 grammes, so that a trifle under 4 ounces of protein would be the amount needed under this rule. In the case of proteid foods averaging 25 per cent. of protein, it would mean the daily consumption of 16 ounces of such food.

"According to the same standards, about 320 grammes (11 ounces) of carbon in proteids or in carbohydrates and fats are needed daily in the food. As the protein is about one-half carbon, 62 of these 320 grammes are supplied in the proteid intake of food, leaving 260 grammes of carbon to be supplied by carbohydrates and fat, and this, according to the ordinary standard, is furnished in the proper proportion if 50 grammes a day of fat be eaten and 500 grammes of carbohydrate food.

"Now, for determining the fuel value of food, a standard of heat is employed that is known as the large calorie. This calorie represents the amount of heat necessary to raise 1 pound of water 4° Fahrenheit in temperature. Now, the daily diet just mentioned would supply about 3025 calories of fuel material for heat and energy, and this is close to the more commonly accepted standards of dietary needs.

"The following is given by Hutchinson as a sample of a day's food in the mixed diet: Beef, 8 ounces; salt mackerel, 4 ounces; two eggs, 3 ounces; butter, 2½ ounces; cheese, 1 ounce; milk, 1 pint; potatoes, 8 ounces; rice, 2 ounces; bread, 9 ounces; sugar, 1½ ounces. This makes 55 ounces of food, or about 3½ pounds, again the common standard of a day's food for an adult person. The fuel yield in calories is 3205.

"In order that the reader may do some figuring for himself, if so inclined, and, in any event, to satisfy a very natural curiosity regarding the compositions of the ordinary foods and their fuel values, tables are presented herewith that have been gleaned from a report furnished to the U. S. Department of Agriculture by Professor Atwater. The data given are for the foods in the condition in which they are purchased. 'Refuse' covers any waste due to bone, shells, trimming, allowance for cores, peels, inedible seeds, etc. The 'ash' is that portion of a food which is not acted upon in the digestive tract, and which leaves the body just as it enters. Much of the water is lost in cooking some of the foods. In meats, cooking brings about a loss, both of fat and of water.

"One example will indicate the method of making computations from the following food tables. Suppose that a pound (16 ounces) of freshly gathered chestnuts be weighed out; then, by the use of the tables, we are able to get at these results.

16 ounces × 0.052 = 0.832 ounces protein.
0.832 ounces protein × 0.16 = 0.133 ounces of nitrogen.
16 ounces × 0.045 = 0.72 ounces of fat.
16 ounces × 0.354 = 5.664 ounces of carbohydrate.
Fuel value in a pound of chestnuts = 915 calories."

ANIMAL AND VEGETABLE FOOD VALUES.

	Refuse. Per cent.	Water. Per cent.	Protein. Per cent.	Fat. Per cent.	Carbohydrate. Per cent.	Ash. Per cent.	Fuel value per pound in calories.
BEEF							
Chuck, ribs	16.3	52.6	15.5	15.0	.....	0.8	910
Flanks	10.2	54.0	17.0	19.0	.....	0.7	1105
Loin	13.3	52.5	17.1	17.5	.....	0.9	1025
Porterhouse steak	12.7	52.4	19.1	17.9	.....	0.8	1100
Sirloin steak	12.8	54.0	16.5	16.1	.....	0.9	975
Neck	27.6	45.9	14.5	11.9	.....	0.7	1165
Ribs	20.8	43.8	13.9	21.2	.....	0.7	1135
Round	7.2	60.7	19.0	12.8	.....	1.0	890
Rump	20.7	45.0	13.8	20.2	.....	0.7	1090
Corned beef	8.4	49.2	14.3	23.8	.....	4.6	1245
Tongue, pickled	6.0	58.9	11.9	19.2	.....	4.3	1010
Dried or salted	4.7	53.7	26.4	6.9	.....	8.9	790
Canned corned beef	.....	51.8	26.3	18.7	.....	4.0	1270
VEAL							
Breast	21.3	52.0	15.4	11.0	.....	0.8	745
Leg	14.2	60.1	15.5	7.9	.....	0.9	625
Fore quarter	24.5	54.2	15.1	6.0	.....	0.7	535
Hind quarter	20.7	56.2	16.2	6.6	.....	0.8	580
MUTTON							
Flank	9.9	39.0	13.8	36.9	.....	0.6	1770
Hind leg	18.4	51.2	15.1	14.7	.....	0.8	890
Loin chops	16.0	42.0	13.5	28.3	.....	0.7	1415
Fore quarter	21.2	41.6	12.3	24.5	.....	0.7	1235
Hind quarter (without tallow)	17.2	45.4	13.8	23.2	.....	0.7	1210
LAMB							
Breast	19.1	45.5	15.4	19.1	.....	0.8	1075
Hind leg	17.4	52.9	15.9	13.6	.....	0.9	860
PORK							
Ham	10.7	48.0	13.5	25.9	.....	0.8	1320
Loin chops	19.7	41.8	13.4	24.2	.....	0.8	1245
Shoulder	12.4	44.9	12.0	29.8	.....	0.7	1450
Tenderloin	.....	66.5	18.9	13.0	.....	1.0	895
Smoked ham	13.6	34.8	14.2	33.4	.....	4.2	1635
Salt pork	.....	7.9	1.9	86.2	.....	3.9	3555
Smoked bacon	7.7	17.4	9.1	62.2	.....	4.1	2715
SAUSAGE							
Bologna	3.3	55.2	18.2	19.7	.....	3.8	1155
Pork	.....	39.8	13.0	44.2	1.1	2.2	2075
Frankfurt	.....	57.2	19.6	18.6	1.1	3.4	1155
POULTRY							
Chicken, broilers	41.6	43.7	12.8	11.4	.....	0.7	305
Fowl	25.9	47.1	13.7	12.3	.....	0.7	765

ANIMAL AND VEGETABLE FOOD VALUES—*Continued.*

	Refuse. Per cent.	Water. Per cent.	Protein. Per cent.	Fat. Per cent.	Carbohydrate. Per cent.	Ash. Per cent.	Fuel value per pound in calories.
POULTRY—*Concluded.*							
Turkey	22.7	42.4	16.1	18.4	.....	0.8	1060
Hens' eggs	11.2	65.5	13.1	9.3	.....	0.9	635
DAIRY PRODUCTS							
Butter	.....	11.0	1.0	85.0	.....	3.0	3410
Whole milk	.....	87.0	3.3	4.0	5.0	0.7	310
Skim milk	.....	90.5	3.4	0.3	5.1	0.7	165
Buttermilk	.....	91.0	3.0	0.5	4.8	0.7	160
Condensed milk	.....	26.9	8.8	8.3	54.1	1.9	1430
Cream	.....	74.0	2.5	18.5	4.5	0.5	865
Cheddar cheese	.....	27.4	27.7	36.8	4.1	4.0	2075
Cream cheese	.....	34.4	25.9	33.7	2.4	3.8	1885
FISH							
Cod, dressed	29.9	58.5	11.1	0.2	.....	0.8	220
Halibut, steaks or sections	17.7	61.9	15.3	4.4	.....	0.7	475
Whole mackerel	44.7	40.4	10.2	4.2	.....	0.7	370
Yellow perch, dressed	55.1	50.7	12.8	0.7	.....	0.9	275
Whole shad	50.1	35.2	9.4	4.8	.....	0.7	380
Shad roe	.....	71.2	20.9	3.8	2.6	1.5	600
Salt cod	24.9	40.2	16.0	0.4	.....	18.5	325
Smoked herring	44.4	19.2	20.5	8.8	.....	7.4	755
Canned salmon	.....	63.5	21.8	2.1	.....	2.6	915
Canned sardines	5.0	53.6	23.7	12.1	.....	5.3	950
Oysters (without shells)	0.0	88.3	6.0	1.3	3.3	1.1	225
Clams (without shells)	.....	80.8	10.6	1.1	5.2	2.3	340
Crabs	52.4	36.7	7.9	0.9	0.6	1.5	200
Lobsters	61.7	30.7	5.9	0.7	0.2	0.8	145
FLOUR, MEAL, ETC.							
Whole-wheat flour	.....	11.4	13.8	1.9	71.9	1.0	1650
Graham flour	.....	11.3	13.3	2.2	71.4	1.8	1645
Wheat flour (roller process)	.....	12.0	11.4	1.0	71.5	0.5	1635
Macaroni, vermicelli	.....	10.3	13.4	0.9	74.1	1.3	1645
Wheat breakfast food	.....	9.6	12.1	1.8	75.2	1.3	1680
Buckwheat flour	.....	13.6	6.4	1.2	77.9	0.9	1605
Rye flour	.....	12.9	6.8	0.9	78.7	0.7	1620
Cornmeal	.....	12.5	9.2	1.9	75.4	1.0	1635
Oat breakfast food	.....	7.7	16.7	7.3	66.2	2.1	1800
Rice	.....	12.3	8.0	0.3	79.0	0.4	1620
Tapioca	.....	11.4	0.4	0.1	88.0	0.1	1650
Starch	.....	.....	.....	.....	90.0	.....	1675
BREAD AND CRACKERS							
White bread	35.3	35.3	9.2	1.3	53.1	1.1	1200
Brown bread	.....	43.6	5.4	1.8	47.1	2.1	1040
Graham bread	.....	35.7	8.9	1.8	52.1	1.5	1195

ANIMAL AND VEGETABLE FOOD VALUES—*Continued.*

	Refuse. Per cent.	Water. Per cent.	Protein. Per cent.	Fat. Per cent.	Carbohydrate. Per cent.	Ash. Per cent.	Fuel value per pound in calories.
BREAD AND CRACKERS— *Concluded.*							
Whole-wheat bread	.....	38.4	9.7	0.9	47.7	1.3	1130
Rye bread	.....	35.7	9.0	0.6	53.2	1.5	1170
Cream crackers	.....	6.8	9.7	12.1	79.7	1.7	1925
Oyster crackers	.....	4.8	11.3	10.5	70.5	2.9	1910
Soda crackers	.....	5.9	9.8	9.1	73.1	2.1	1875
SUGARS, ETC.							
Molasses	.....	.....	.....	.....	70.0	.....	1225
Plain candy	.....	.....	.....	.....	96.0	.....	1680
Honey	.....	.....	.....	.....	81.0	.....	1420
Granulated sugar	.....	.....	.....	.....	100.0	.....	1750
Maple syrup	.....	.....	.....	.....	71.4	.....	1250
VEGETABLES							
Dried beans	.....	12.6	22.5	1.8	59.6	3.5	1520
Lima beans, shelled	.....	68.5	7.1	0.7	22.0	1.7	540
String beans	7.0	83.0	2.1	0.3	6.9	0.7	170
Beets	20.0	70.0	1.3	0.1	7.7	0.9	160
Cabbage	15.0	77.7	1.4	0.2	4.8	0.9	115
Celery	20.0	75.6	0.9	0.1	2.6	0.8	65
Green sweet corn (edible portion)	.....	75.4	3.1	1.1	19.7	0.7	440
Cucumbers	15.0	81.1	0.7	0.2	2.6	0.4	65
Lettuce	15.0	80.5	1.0	0.2	2.5	0.8	65
Mushrooms	.....	88.1	3.5	0.4	6.8	1.2	85
Onions	10.0	78.9	1.4	0.3	8.9	0.5	190
Parsnips	20.0	66.4	1.3	0.4	10.8	1.1	230
Dried peas	.....	9.5	24.0	1.0	62.0	2.9	1565
Shelled peas	.....	74.6	7.0	0.5	16.9	1.0	440
Potatoes	20.0	62.6	1.8	0.1	14.7	0.8	295
Rhubarb	40.0	56.6	0.4	0.4	2.2	4.4	60
Sweet potatoes	20.0	55.2	1.4	0.6	21.9	0.9	440
Spinach	0.0	92.3	2.1	0.3	3.2	2.1	95
Squash	50.0	44.2	0.7	0.2	4.5	0.4	100
Tomatoes	.....	94.3	0.9	0.4	3.9	0.5	100
Turnips	30.0	62.7	0.9	0.1	5.7	0.6	120
CANNED VEGETABLES							
Baked Beans	.....	68.9	0.9	2.5	19.6	2.1	555
Peas	.....	85.3	3.6	0.2	9.8	1.1	235
Green corn	.....	76.1	2.8	1.2	19.0	0.9	430
Succotash	.....	75.9	3.6	1.0	18.6	0.9	425
Tomatoes	.....	94.0	1.2	0.2	4.0	0.6	95
FRESH FRUITS							
Apples	25.0	63.3	0.3	0.3	10.8	0.3	190
Bananas	35.0	48.9	0.8	0.4	14.3	0.6	260
Grapes	25.0	58.0	1.0	1.2	14.4	0.4	295

ANIMAL AND VEGETABLE FOOD VALUES—*Concluded.*

	Refuse. Per cent.	Water. Per cent.	Protein. Per cent.	Fat. Per cent.	Carbohydrate. Per cent.	Ash. Per cent.	Fuel value per pound in calories.
FRESH FRUITS—*Concluded.*							
Lemons	30.0	62.5	0.7	0.5	5.9	0.4	125
Muskmelons	50.0	44.8	0.3	.....	4.6	0.3	80
Oranges	27.0	63.4	0.6	0.1	8.5	0.4	150
Pears	10.0	76.0	0.5	0.4	12.7	0.4	230
Raspberries	.....	85.8	1.0	.....	12.6	0.6	220
Strawberries	5.0	85.9	0.9	0.6	7.0	0.6	150
Watermelons	59.4	37.5	0.2	0.1	2.7	0.1	50
DRIED FRUITS							
Apples	.....	28.1	1.6	2.2	66.1	2.0	1185
Apricots	.....	29.4	4.7	1.0	62.5	2.4	1125
Dates	10.0	13.8	1.9	2.5	7.6	1.2	1275
Figs	.....	18.8	4.3	0.3	74.2	2.4	1280
Raisins	10.0	13.1	2.3	3.0	68.5	3.1	1265
NUTS							
Almonds	45.0	2.7	11.5	30.2	9.5	1.1	1515
Brazil nuts	49.6	2.6	8.6	33.7	3.5	2.0	1485
Butternuts	86.4	0.6	3.8	8.3	0.5	0.4	385
Chestnuts, fresh	16.0	37.8	5.2	4.5	35.4	1.1	915
Chestnuts, dried	24.0	4.5	8.1	5.3	56.4	1.7	1385
Cocoanuts	48.8	7.2	2.9	25.9	14.3	0.9	1295
Cocoanuts, prepared	.....	3.5	6.3	57.4	31.5	1.3	2865
Filberts	52.1	1.8	7.5	31.1	6.2	1.1	1430
Hickory nuts	62.2	1.4	5.8	25.5	4.3	0.8	1145
Pecans	53.2	1.4	5.2	33.3	6.2	0.7	1465
Peanut	24.5	6.9	19.5	29.1	18.5	1.5	1775
Pinon	40.6	2.0	8.7	36.8	10.2	1.7	1730
Walnuts, black	74.1	0.6	7.2	14.6	3.0	0.5	730
Walnuts, English	58.1	1.0	6.9	26.6	8.6	0.6	1250

"In contrast to the common standards of diet, which call for 20 grammes of nitrogen daily in the food and the total fuel value of from 3000 to 3500 calories, let us take the case of Horace Fletcher, an American who seems destined to prove the new Moses of nutrition. Years ago ill health forced Mr. Fletcher, once a college athlete, to devote serious attention to his health. He chose to regain health through food, pure air, and exercise. His experiments with himself led him to the adoption of what most people would term a starvation diet—*but he thor-*

oughly masticated his seemingly small quantity of food. Mr. Fletcher has demonstrated his ability to maintain perfect health and normal activity on a diet that, in a course of experimenting, amounted to $\frac{3}{17}$ of an average dietary of to-day.

"While under observation at Yale College Mr. Fletcher subsisted for several days on a diet that supplied him with a daily average of 44.9 grammes of proteids, 38 grammes of fat, and 253 grammes of carbohydrate and with a daily fuel average of 1606 calories. Anderson, the University's physical director, kept Mr. Fletcher at the same kind of hard exercising work as that undergone by the varsity crew in training. Anderson had this to say of his observations of the experiment:—

" 'My conclusion, given in condensed form, is this: Mr. Fletcher performs this work with greater ease and with fewer noticeable bad results than any man of his age and condition I have ever worked with.'

"Not long ago a squad of regular army soldiers was experimented upon at Yale along the lines of Mr. Fletcher's dietary practices. The proposal to cut down the supply of food was so awesome to some of the soldiers that they deserted, but those who acted upon Mr. Fletcher's 'low-diet' plan performed at the same time hard work in the Yale Gymnasium, and came out of the several weeks' experiment in splendid trim. Yet here is a sample of the day's food for one of the men:—

"*Breakfast.* — Soft oatmeal, 150 grammes; milk, 100 grammes; sugar, 30 grammes; butter, 10 grammes; bread, 30 grammes; 1 cup of coffee; total, 350 grammes.

"*Dinner.*—Baked macaroni and cheese, 200 grammes; stewed tomatoes, 200 grammes; bread, 50 grammes; tapioca peach pudding, 150 grammes; coffee; total, 350 grammes.

"*Supper.*—French fried potato, 100 grammes; fried bacon, 20 grammes; bread, 75 grammes; jam, 75 grammes; tea; total, 350 grammes.

"This, according to Professor Crittenden, in charge of the experiment, meant intake in a day of 7.282 grammes of nitrogen and

a total fuel value of 1824 calories. When it is remembered that about 30 grammes equal an ounce, it will be understood upon how small a quantity of food health and activity were maintained.

"Rabagliati, one of England's famous cancer specialists, and a recognized expert in nutrition, has estimated that about 12 to 24 ounces of food, depending upon weight, condition, and activity of the individual subject, represent the sanest and safest quantity of food for the adult human being.

"In closing this chapter, it may be added, by way of general statement, that the average conclusion of recent investigators in the field of 'low dietaries' is that even those who pride themselves upon their very moderate eating consume every day from two to three times as much food as they need, and that every morsel of food taken in excess of what is really requisite is a detriment to health, with no compensating advantage possible."

CHAPTER XIII.

PROGNOSIS.

THE prognosis in any disease depends very much upon the thoroughness with which the treatment is carried out. That is true with the narcotic drug addictions, as well as with other diseases. Therefore, in devising a course of treatment the author endeavored to make the same as complete, and as fully in accord with laws of physiology and with the general principles of medicine, as possible.

The author has often been asked the question: "What per cent. of patients cured remains well?" No direct, unqualified answer can be made to that question. The permanency of cure in drug addiction depends upon many factors, but the principal one is the patient himself. Much also depends upon the manner in which the addiction was formed.

In order to estimate with any degree of certainty the probability of permanency of cure in any given case, it is necessary to take into consideration the character and habits of the individual before the addiction was formed, the manner in which the addiction was formed, the purposes of life which dominate him, and the experiences to which he has been subjected since beginning the use of the drug, including the number, kind, and results of treatment he has taken for the addiction. With this data at hand, the probability of permanency of cure can be foretold with a fair degree of accuracy.

If the use of the drug was taken up as a dissipation, the chance of permanent cure is very slight, since the use of the drug would increase rather than overcome

such a tendency to dissipate, and, since the tendency to dissipate which originally led to the use of the drug would still exist, and would likely be strengthened rather than weakened by the use of the drug, that tendency would likely control the patient and lead again to the use of the drug.

However, even in these unpromising cases, if the slavery from the use of the drug has effected such a change in the mental attitude of the drug user as to overcome this bent toward dissipation, then a permanent cure may be effected, even in some of these cases, notwithstanding the fact that the use of the drug was begun as a dissipation. It takes a calamity, such as years of drug slavery, to bring some people to their senses and cause them to think. If the abject slavery brought about by the use of a drug shall have taught such a dissipated one the lesson and impressed that lesson strongly enough to influence his future conduct even in these unpromising cases sometimes a permanent cure may be made.

But not more than 15 per cent. of drug habitués enter upon the use of a drug as a dissipation, or as a sequence of other forms of dissipation. The remaining 85 per cent. are usually brought into the addiction, either inadvertently or accidentally.

Probably 75 per cent. of all laymen addicted to the use of drugs owe their addiction to the indiscreet or necessary use of opiates by physicians. Protracted painful ailments force upon them a condition which they are unable afterward to throw off by their own efforts. These victims of the drug are never willing slaves; they are rebels throughout the entire period of subjugation, and they always hope and look forward to a time when they may be set at liberty.

When a patient of that class is really cured, when put back on his feet free from the dominating influence of

narcotics and given a fair chance to live without them, he rarely returns to their use; in fact, the author's experience with such persons is that there is little, if any, tendency to relapse.

There is this difference, however; these patients do not bear pain well, that is, the continued use of the drug and the suffering that at times occurs from it reduce their tolerance of pain. Therefore, if any severe painful ailment overtakes them after they are freed from the addiction, and it becomes necessary for them to use opiates, even for a few days, the addiction is soon reformed. They become entirely dependent upon the drug in very much less time than it took for the addiction to become confirmed in the first instance.

It is essential to the permanency of cure in any case that the cause which originally led to the addiction be removed. If this was a chronic painful ailment which still exists, then it may not be expected that the addiction can be cured permanently without the cure of the painful ailment upon which it depends.

This ailment should be treated in connection with the addiction, or immediately following it, to the end that the patient may not be called upon to stand the suffering from it without the relief which he formerly obtained from the drug.

If the addiction was taken up inadvertently, as in case of a physician using a drug to prolong his working hours, he must have become so impressed with the gravity of his error as to lead him to entirely renounce such a course and to give up the use of all stimulants. There can be no compromise in this matter without failure.

The use of alcoholic beverages, even of the mildest kind, will inevitably lead to a resumption of the narcotic.

Many authors still advise the use of alcoholic liquors in the after-treatment of these cases, but no more fatal error was ever made.

No man who has been addicted to the use of morphine can afterward use alcohol in moderation. If he uses it at all in any form he is sure to go to excess and this excess leads to his sobering up by returning to the use of the opiate. If he would continue to be free from drug slavery, he must give up stimulants of all kinds and live a sober, discreet life.

The almost universal failure to permanently cure drug addiction by the methods of treatment heretofore in vogue is fully accounted for when we consider the matter from a dispassionate and impartial point of view.

Classification of the condition as one having no pathology, as a mere appetite or vice, removed all basis for rational therapeutic endeavor. Regarding the patient as a fiend, a pervert, one devoid of principle and moral purpose, placed such a barrier between him and his physician that no common ground could be found upon which to establish the confidential relations which were essential to success. The failure to recognize the widespread function derangement present as pathological factors to be met by therapeutic measures led the physician into the erroneous conclusion that the withdrawal of the drug was all that was necessary to constitute a cure.

In endeavoring to carry out even this mistaken idea of treatment, the gradual-reduction method was usually adopted. This was simply a torturing process by which the patient was starved off of the drug, leaving him in a far more wretched condition than before the beginning of treatment.

During this long-drawn-out siege of suffering the patient's mind dwelt almost constantly upon the drug

and he longed for the relief which it alone could give him. This one thought occupied his mind to the exclusion of everything else. The urgent demand for the drug to relieve the intense suffering due to the toxic condition of his system was so great that the patient could think of nothing else.

This intense physical and mental strain converted the patient from a simple drug user, a morphinist, into a morphinomaniac. The morphinist continues to use the drug because his physical condition demands it, and he will rarely return to its use if that physical demand is overcome.

On the other hand, the morphinomaniac is controlled by his mental condition rather than by his physical. No matter how perfectly he may be freed from all physical necessity for the drug, if the mania is not corrected, he will resume its use as soon as he is given liberty.

He must be cured mentally, as well as physically; but instead of the gradual-reduction method of treatment doing that, it is the most effective means of perpetuating the mania that the ingenuity of man could have devised.

There is no question but that the employment of the reduction method of treatment has done many, many times more to render these helpless victims incurable than it has done toward curing them. The failure necessarily growing out of the employment of this unnatural and unscientific process has done more to damage the cause of drug users with the profession and the public than all other influences combined. It has done much to create the impression that these victims are hopelessly incurable, that they have no desire to be cured, and would not remain well if cured.

This process not only failed to correct the physical derangements present, but impaired the mind to such a

degree that the patient no longer acted from reason, but was dominated by a mania which always led him in a wrong direction. Notwithstanding the fact that he was not cured, either mentally or physically, he was nevertheless expected to stand on his feet and be a man. Because of his inability to do this he has been stigmatized as a fiend, a pervert, one wholly given over to a vicious appetite.

This verdict is as unreasonable as it is cruel and unjust. One should not be thus condemned until he has been given a reasonable chance; he should not be expected to remain well until he has really been cured.

Notwithstanding the failures of the past, these victims can be restored. They can be cured, provided the process of cure is a rational one, one which will effectively correct the physical disorders present without creating a mania to be left in its stead. When these patients are really cured, physically and mentally, when they are given a fair chance, a large per cent. of them remain well.

It is well to consider somewhat in detail the conditions which favor, and which render unfavorable, the prognosis. Age and the length of time the addiction has existed are both very important factors.

The age of the patient becomes important because of the difference in the sensitiveness of a nervous system in aged persons and in young persons. Then, again, the difference in ambition of the two ages is marked. Persons in early life seem to think they have a fund of energy and reserve resources that cannot be exhausted; therefore, they will undertake to do much more than their strength will really sustain them in. They are not willing to take the affairs of life moderately or to travel at a moderate rate. They often seek to do

two days' work in one and thus the temptation to stimulate to enable them to lengthen out their working hours is very great.

Persons who have no fixed convictions as to the use of stimulants are very prone to resort to them to sustain them during every emergency. Therefore, those who are young and have inadvertently or otherwise become addicted to an opiate and have been taken off it feel as if they have lost a good deal of time during their addiction, and must now make up that loss. If this idea is not overcome by caution they are prone to take stimulants of some kind to sustain them and a stimulant of any kind is simply the first step toward confirmed drug addiction.

On the other hand, older persons have become more settled in life and are willing to take life at a slower pace. Then, too, the nervous system has undergone the changes incident to age and their reflexes are nothing like so active. They do not feel so acutely or so intensely and are not so prone to seek relief from every slight ailment. Therefore, the prognosis in aged persons is more favorable than in younger ones.

Another factor, a very important one, is the length of time the drug addiction has continued. The use of opiates during the first year or two years of addiction brings some pleasurable sensations to the drug user. It stimulates and brings on a condition of ease and comfort which, to some people, is very delightful. Then, again, up to this time they have not learned to dread the effects of the drug; they cannot see that it has done them much harm; they have not felt the sting of the abject slavery due to its use.

Therefore, so long as the drug gives them a pleasurable sensation, and until they have thoroughly learned

the lesson and felt the sting of the slavery, they are more prone to experiment with it, to try a single dose for some temporary ailment, than they would be had the lesson been more deeply impressed upon them by prolonged slavery and suffering.

In the experience of the author, persons who are taken off the drug during the first year, or even during the first two years, of their addiction are more prone to return to it than those who have been enslaved by it for a longer time. This rule has a few exceptions, and those exceptions obtained in the cases of those who are forced into the addiction by some serious ailment, and who have day by day rebelled against it and have not in any way allowed the use of the drug to obscure their judgment in the matter, or to lead them to use it as a dissipation to any extent whatever. Such patients as these are curable at any stage, and if given a proper chance for freedom they have no tendency to relapse. As a rule, until one enslaved by morphine has had an experience such as to make him abhor the drug he is more liable to resume its use than he would be after that experience had been fully acquired. Time and prolonged suffering are often necessary to sufficiently impress this lesson.

Persons of 50 or more years of age, and who have taken an opiate fifteen to twenty years continuously, have less tendency to relapse than younger persons, or than those who have used the drug for a shorter period. The author knows a number of such persons who have remained free from the drug notwithstanding the fact that they continued to suffer from a chronic ailment, such as asthma, etc., after the cure of the addiction.

The majority of relapses which have occurred in the author's work have been due to the use of alcohol in some form. The author has taken great pains to in-

struct his patients as to the dangers attending the use of alcoholic drinks, and many of them have lived for years according to those ideas, but some have not. It is a very difficult thing to bring a man to acknowledge, even to himself, that he has so impaired his self-control as to be unable to take a single drink of some alcoholic liquor without going to excess.

After they have remained off the drug for some months, or even a year or so, they feel that they have fully regained their self-control, and that they can do with impunity the things which they did before they became addicted to a narcotic; in this they are mistaken. The narcotic makes an impression on their central nervous system and upon their mind and powers of self-control that will be a part of them as long as they have a memory.

Alcohol in any form may bring about a state of well-being and comfort for a short time, but the effects of alcohol are very transient. As soon as the primary effect begins to wane, a period of depression occurs. This depression brings acutely to the memory of the individual the old feeling: the old unpleasant, unnerved condition which he so much dreaded when he sought to fight off taking his drug.

The depression from alcohol is intolerable to one who has been a victim of a narcotic drug, and, instead of bearing this with fortitude, he will seek another drink of the alcoholic mixture. This in turn brings about a state of well-being, only to subside in a very short time to the same unpleasant nervous condition.

In this manner the demand for the alcoholic beverage is very rapidly produced, and before the patient realizes it he is taking from three to a dozen drinks of some alcoholic mixture per day. This continues for a

few weeks, the quantity being increased until the nervous system is so impaired by it and the digestion so disordered that a stronger narcotic must be taken to quiet the nervous system. This stronger narcotic soon leads back into drug slavery. The only course that is at all safe for one who has been taken off of a narcotic drug is to give up, for good and for all time, the use of alcohol as well as all other forms of narcotics.

Even coffee does harm. It would not be so hurtful if it were only the stimulating effect that is produced by it, but the coffee bean contains a considerable quantity of tannic acid and this is powerfully astringent.

The effect of tannic acid on the digestive organs is so damaging, it so retards the activity of the secreting and excreting organs, that the system soon becomes toxic under its influence. This astringent effect tends to produce constipation. Whatever constipates throws the entire system out of order and brings on a toxic condition, and this is a very dangerous condition for one who has been a drug slave.

One who would remain free from drug slavery must keep his vital functions in a good working state, and he cannot do this if he takes an astringent, such as coffee, into his system or uses alcoholic beverages of any form.

Tobacco is also hurtful, especially cigarette smoking, but this is so universal and seems to have such a hold on the American people that the author despairs of any reform along that line. To be at all secure from relapse, drug habitués who have been freed from their addiction must cultivate habits of regularity and live free from excesses of all kinds.

CHAPTER XIV.

ERRORS IN METHODS.

SOME REASONS FOR THE PAST FAILURES IN TREATMENT OF MORPHINISM.

It is hardly necessary to make an extensive appeal to medical literature to show that failure has been the almost universal result of attempts at treatment of the morphine or other narcotic drug addiction (disease). Observation and experience have doubtless convinced most physicians that such is the fact. So far as can be judged from the expressions of physicians with whom the writer has discussed this subject, and from its literature, little hope has been held out to this class of sufferers by our profession.

Anders, in his recent work on "Practice," says: "The treatment is manifestly difficult" . . . and "the likelihood of a cure is extremely remote." Da Costa says, "There is no remedy for the opium habit." This is in accord with the prognosis given by other writers.

These opinions are based upon the accumulated experiences of the past, and it must be admitted that the extreme rarity of curing a patient of this class by any of the methods known to medical literature fully justifies these conclusions.

The treatment of morphinism has usually been undertaken in one of three ways, known, respectively, as the "sudden-withdrawal," the "rapid-reduction," and the "gradual-reduction" methods. The names by which these methods of treatment are known indicate the general course of procedure in each. The gradual-re-

duction method has been the one most often resorted to, and until recently it has had the almost universal indorsement of American authors. Let us consider the reasons for failure when this method has been resorted to.

In this method, without preparatory treatment, the supply of the drug is diminished day by day, until in the course of four to twelve weeks the last of the drug is left off. This entire course of treatment is attended by general malaise, wakefulness, restlessness, nervousness, and at times persistent nausea and diarrhea with extreme prostration, and, usually, by the time the last of the drug is left off, the poor victim is so exhausted that he is unable to maintain himself without resort to other stimulants.

Of this condition Erlenmeyer says: "The patient after withdrawal is left in such a condition of physical weakness and mental dilapidation as to be the victim of intolerable suffering and unfit for enjoyment or application to work. He cannot sleep, he has no appetite, often vomits, and feels too much used up to rise from bed. This condition continues for a long time and grows worse from week to week. Various attempts at cure prove useless. A return to morphine is the only remedy."

To palliate this condition strychnine and alcoholic drinks were usually freely administered, with chloral and other hypnotics to induce sleep.

The drug in the system was considered "The Malady"; in fact, the only element in the case requiring attention. To withdraw or discontinue that was the aim of all therapeutic endeavor. When the patient had been off his drug for a few days, or a few weeks at most, the cure was considered complete.

In order to see more clearly wherein past methods have been at fault, let us consider the pathology of this

condition. Structurally, we will say that the pathology is nil, as no structural changes are discernible either in the brain or other tissues of the body.

The pathological changes are entirely of a functional nature, but these are marked and well defined, and are most noticeable in the digestive tract. The tongue is coated, the breath is foul, constipation is habitual, appetite is poor, digestion is much impaired, and the powers of assimilation are so diminished that the entire muscular and nervous system is in a state of semistarvation. Oxidation of the blood is imperfectly accomplished, excretion and secretion are impaired, and the entire system is surcharged with the products of denutrition.

Let us consider the effects of the first dose of morphine introduced into the system. These are a state of quietude or torpor; drowsiness, soon succeeded by sleep, with diminished or completely arrested peristaltic action; constipation, with reduced activity of all the secreting and excreting glands. In the course of eight to twelve hours the hypnotic effects, as well as most of the other effects, have subsided, and the functional activity of the system has become normal, and, possibly, secretion and excretion are carried on at a slightly accelerated rate, but it requires several days for this increased activity of the excreting organs to free the system from the products of waste that should have been eliminated during the time these functions were retarded by the benumbing influence of this drug.

Now, if before that is accomplished another dose of the drug is taken, the eliminators are again interfered with in their work, and if this is repeated from day to day the system soon becomes surcharged with the products of tissue disintegration and their fermentative products. These products play a much more important

rôle in causing the difficult complications met upon the withdrawal of morphine, known as abstinence symptoms, than does the drug itself.

It cannot be shown that the drug in the system, or its oxidized product,—oxydimorphine,—atom for atom, is more poisonous to the patient than are the products of tissue disintegration, and, since these are present in many times greater quantities than the drug or its product, they should be looked upon as the chief pathological factor so far as the physical disorder is concerned. In the treatment of these addictions the drug in the system is not so much to be contended with as the products of waste which it imprisons therein.

Pari passu with this physical poisoning go the mental changes. The will-power is greatly impaired, mental activity and independence of action and thought are diminished, and in their stead a state of indecision and dependence, with a morbid dread of pain, are established.

The drug user becomes thoroughly confirmed in the belief that his well-being and even his life depend on his receiving his supply of drug regularly. This completely robs him of independence and self-assertiveness. The mind is blunted, inactive, servile, dependent; unable to receive with acuteness new impressions or to readily recall those formerly received. He feels that he is a helpless victim in the clutches of a monster with whom he is totally unable to cope; his mental surrender and enslavement are complete.

These mental impressions are deep and lasting, and, even if the physical disorder is fully overcome, this mental state alone, if left uncorrected, will perpetuate dependence upon drugs.

While morphinism has been classed as a mania, and the importance of the mental side has been insisted upon

by some medical writers, in the treatment usually advised the mental element has not received that practical recognition that its importance demands or that could reasonably be expected to correct such a disorder. In fact, the course of therapeutic management has usually been such as to perpetuate the mental bias, the mania, if one existed rather than to overcome it.

Let us examine the leading features of a case treated by the gradual-reduction method and see if there is anything in that course that could be expected to cure a mania. The patient is taking, say, 20 grains of morphine a day at two doses, hypodermically. The physician plans to reduce the dose by 1 grain a day for the first ten days and then by a less quantity until zero is reached in thirty or forty days.

After the first three or four reductions the dose does not entirely relieve the patient, nor does that measure of relief last until the time for the next dose. Several hours before the time for each succeeding dose the patient begins to be more uncomfortable and to look forward to the next dose.

Time drags heavily and as the hour for his dose draws nearer his suffering increases and his anxiety for the drug is greater. Thus, his mind dwells on the drug and its effects from hour to hour and his dependence upon it is more and more deeply impressed upon him. This is continued day after day, and as his doses grow smaller the relief is less complete and the hours of suffering longer.

While the reduction was being made, each injection gave a measure of relief, and the patient was thus taught to expect and depend upon them for relief, and, notwithstanding the fact that the zero point in the reduction may have been reached, the physician still finds it neces-

sary to give the injections at the accustomed time, and, while these may now contain no opiate, about the same measure of relief is obtained as when they did contain the opiate, simply from the mental impression, suggestion of relief, which the patient had been taught to expect from them.

When the patient had been taken off his drug by this process and kept off by supervision and restraint for a few weeks, and his physical condition sufficiently improved, he was discharged as cured, notwithstanding the fact that the profound mental impressions made on him during this protracted and trying ordeal were still vivid and uneffaced.

Now, it is contended that, no matter how excellent a patient's physical condition may become, following such an ordeal he is not cured of the addiction in any reasonable sense of the word, but that he is still as truly a morphinomaniac as he was the day the treatment was begun and even more so.

Such a patient will as certainly return to the use of the drug as he is given his liberty, not because all morphine patients relapse, for they do not, but because he was not really cured.

This long-drawn-out course of treatment, the repeated anticipation and realization of relief from the drug, coupled with entire failure to get relief from other sources, has so intensified and perpetuated his dependence upon the drug that the mental disorder, the mental habit, the mania, is as strong as ever, yes, much stronger and will control his conduct.

In order to be successful in the treatment of these addictions, the therapeutic management must be such as to overcome the mental habit, the mania, as well as cure the physical disease, but, instead of the gradual-reduc-

tion method doing that, *it is the most effective manner of perpetuating this mental disorder that the ingenuity of man could devise.*

Mental impressions, ideas, control the conduct of men; in fact, the habit of life, the character, is simply the sum or product of the mental impressions received by the individual.

It is a well-known fact that some of the greatest geniuses the world has ever known were dominated by one idea; also that many insane persons are perfectly sane upon all subjects but one, but upon that they are intensely insane. Without any discernible change in either the function or structure of the brain, this one idea has become so implanted in the mind that it is dwelt upon to the exclusion of all others.

This is true of the morphinomaniac. Upon all other subjects he may be perfectly sane, but upon this he has a mania. In this case the mania is the product of suggestion. The frequently repeated thought—autosuggestion—of relief, of a state of well-being from the use of the drug, has so firmly implanted this idea in his mind that he inevitably follows it.

It has been fully demonstrated that mental impressions can be so fixed in the mind, so indelibly stamped upon the mental machinery by suggestion alone, that such impressions will dominate the life of the individual.

To illustrate the power and permanency of mental impressions, an incident in the life of a prominent minister which is well vouched for is here related. After partaking of a sumptuous repast with one of his parishioners, this preacher set out on horseback for his next appointment.

After riding several miles through the woods he came to a small strip of prairie. Upon entering this he

noticed the carcass of a horse a short distance from the road in a high state of decomposition. The odor from this was so disagreeable that before he could pass it he was intensely nauseated and vomited freely. He says he thought nothing of this, as a disagreeable odor would often nauseate him, and that he had not thought of this experience for many months, when, more than a year afterward, he had occasion to pass that way again. Upon arriving at the little prairie and seeing the bones of this animal, notwithstanding no odor emanated from them, the impression made on his mind on his former trip recurred to him with such force that he at once became sick at his stomach and vomited.

If a single impression can have such a deep and abiding effect on a normal man, how much more lasting may we expect these impressions to be on one whose mind is already warped and subdued to a state of dependence upon a drug, if that dependence is accentuated by the repeated expectation and realization of relief from its use? Is it not reasonable, in fact inevitable, that these impressions, made day after day throughout a protracted course of treatment, should become an integral part of the man's mental state; that they should dominate his conduct as completely as a mania of any other type would do?

Is it not a matter of common experience that mental states do dominate men in all the walks of life? Then why should we not look for it and acknowledge its potency in the morphinomaniac? When we do this and intelligently plan our course of treatment so as to effectually correct this mental disorder at the same time that we cure the patient of his physical disease, we may reasonably expect success to attend our efforts, but not until then.

It is essential to recognize the fact that we have to deal with a condition presenting a dual disease, a mental and physical disorder, either of which would be sufficient to control the conduct of the patient and cause a return to the use of the drug, even if the other were entirely overcome.

Instead of pursuing a course of therapeutic treatment that will intensify the disordered mental state, the therapeutic measures should be such that they may be used to correct the mania, overcome the patient's dependence upon his drug, and re-establish confidence in himself. A patient of this class should not be considered cured until his mental, as well as his physical, equilibrium has been restored.

Much difference of opinion exists in the profession as to the curability of drug habitués. In discussing this subject a few years ago before a medical association one physician took the position that "None of these cases were ever cured by treatment, that he had never seen a drug habitué who wanted to be cured and would not believe one who said he had been cured."

Another physician, a prominent neurologist, said that "He agreed fully with the former speaker, that all persons who fall a victim to narcotic drugs were primarily neurotic by nature, that they were all unstable in character and temperament."

A large per cent. of the members of the profession hold opinions in accord with the two just quoted, and these opinions have filtered down to the laity until public opinion has been molded by them.

Such opinions as these arise mainly from the fact that physicians and the public generally have most often come in contact with only the lowest type of drug habitués, those who are "down and out," who from

poverty or other adverse conditions have been forced to resort to all manner of questionable means to secure a drug supply, and who because of these hard conditions have lost all hope and hold on life.

It is by impressions made by drug habitués of this class that professional and public opinion has been molded, but these "down and outs" in no wise represent the great army of drug slaves who have innocently or inadvertently been entrapped into slavery, and who bear their misfortune in silence and keep themselves out of public view.

The idea that only neurotics fall a victim to narcotic drugs is absurd. Anyone, be he ever so stoical, will become enslaved by a narcotic if it is given to him continuously for a sufficient time. It is true that those of a neurotic temperament fall into drug slavery much more readily than those of a normal type, but none are exempt, none able to resist its prolonged effects.

Those who hold to the view that drug habitués do not want to be cured could not be more greatly mistaken.

A large majority of them want to be cured and only continue to live in their abject slavery because of the hope which they have of at some time being freed from it. In many cases their life is one continuous prayer for freedom, coupled with repeated efforts to obtain it. If the hope of being freed from drug slavery were extinguished the victim would commit suicide.

The reason, in fact the only reason, that a large per cent. of these cases have not been permanently cured is that the methods by which their cure has been attempted are grossly unscientific and inefficient, and therefore could not be expected to succeed. The profession has taken a very uncomprehensive and one-sided view of this subject, and because of failure to cure them by

inefficient methods has come to look upon them as wantonly abandoned to their habit and incurable.

No opinion was ever more incorrect or unjust. These people not only desire to be cured, but morphinism is the most readily curable of all the chronic ailments, and when the cure is really effected it is as permanent as the cure of any other disease.

The curability of drug addiction is no longer a matter of doubt: the evidence of their almost universal curability that is now available is sufficient to convince anyone. They are curable by the methods which the author has brought to the attention of the profession, and he has no hesitation in saying that those who hold contrary views had as well now begin to revise their opinions on this subject. If the more than three thousand drug habitués which the author has treated with a failure to cure in less than 1 per cent. could be marshaled before the profession and their condition seen and their testimony taken, the cure of narcotic addiction would not be longer questioned. While these disenslaved ones cannot be bodily brought to the view of the profession at a glance or in mass, they are multiplying and are being seen and their conduct watched by such a number of medical men that the available testimony will soon be so overwhelming as to convince the most skeptical.

That the cures may be more permanent, it is well to consider further the management of the mental element in these cases.

Our methods should be varied according to the varying phases of the mental disorder found in the case.

There is a vast difference in drug habitués: some are merely morphinists, while others are morphinomaniacs. The morphinist is cured when his physical disease is overcome, provided he is not made a morphinomaniac by

the treatment to which he is subjected in doing this. A considerable per cent. of drug users are morphinomaniacs and require both physical and mental treatment.

The management of the mental aspect of any case depends upon the character of the mania which exists. In most cases the leading features of the mania will be found to be a firm conviction that the drug is essential to life and comfort: that intolerable suffering and probably death would occur if they were deprived of it; that no other drug will take its place or relieve any of their ailments; that the drug is their only friend and only source of reliance.

While they have no faith in drugs other than this one, they will be found to have less faith in physicians in all matters touching their addiction; in fact, they usually possess a morbid suspicion or distrust of physicians in all things connected with their addiction.

When a man of this class presents himself for treatment the first step is to engage him in conversation. Ascertain the manner and cause of formation of the addiction, the number of efforts the patient has made to leave off the use of the drug and with what success, the number and character of treatments he has taken, the duration and severity of the suffering endured while undergoing these treatments, as well as following them, and the final results. In other words, make a full and accurate inventory of the patient's mental state and the different experiences that have contributed to its formation.

When you have finished talking with him you will wonder how it is that he has confidence enough in you to apply for treatment, but you need not flatter yourself too much; if you will make careful inquiry on that point you will find that he has just barely enough faith in you

to bring him across the threshold of your institution, but no more.

You may assure him that you can cure him of his addiction in a short time and with little suffering, and, while this is what he wishes to hear you say, he cannot and does not accept it as really true. You may bring him into the company of other cured patients and let them give him the most positive assurance that they have taken treatment, and that you have done all and more than you promised to do for them, yet his past experience, especially if he has taken several treatments without success, so contradicts all of this that he cannot believe any of these statements, and yet his anxiety to be free from drug slavery and the latent hope of securing such freedom that still lingers in his bosom lead him to take the treatment.

Having obtained a full knowledge of his mental state, you are ready to enter upon the treatment. The first step is to make a searching physical examination. In treating other diseases, this is made to ascertain the patient's physical condition, and, while this is one of your objects in making this examination, it is not the only one or even the chief one.

The one absolute prerequisite to success is to gain the confidence, the perfect, unquestioning trust, of your patient, which you have found to be so completely wanting.

This examination should be made with such care and thoroughness and with such diagnostic instruments as to fully impress upon the patient that you are a master in your profession, and that he is now in the hands of one who is able to contend successfully with all his physical ailments, as well as his drug addiction. Your manner should be one of quiet, unassuming self-pos-

session, positive, confident, but by no means self-assertive.

During or following this examination explain to the patient the pathology of his condition: the cause and manner of development of the various painful symptoms which he has experienced in his efforts to leave off the drug or during his former treatments.

Take him completely into your confidence, as much as if he were a physician in consultation. Do not treat lightly any of the painful symptoms which he has experienced during or following his former efforts to leave off the drug. Make a careful explanation of the cause of each and explain to him the methods by which you expect to avoid them in the treatment you are preparing to give him, and assure him positively that you will be able to do so.

Tell him that you do not expect to wait for these symptoms to develop, but that you will remove their cause beforehand and thus prevent their development. Tell him that when his system is fully cleansed of effete material and his addiction cured, as you are preparing to cure it, his system will respond to other remedies, and that it will not be necessary to resort to morphine to relieve any ailment he may have.

While your patient will not fully accept any of your assurances at this time, it is well to give them beforehand, as suggestions are often first doubted, then considered, and finally accepted and acted upon.

Remember that the mania in these cases is not due to structural lesion of the brain, but is the product of suggestion and is therefore amenable to treatment by suggestion, *provided the suggestive treatment for the mania is given in connection with efficient therapeutic measures by which the physical disorder is overcome.*

Suggestion is one of the most potent forces with which man is thrown in contact. It influences everyone, and at all times. Every man, no matter what his character may be, is constantly influenced by suggestion and is influencing someone else by suggestion. It is an omnipresent and powerful force in the life of every human being.

Be careful never to deceive your patient in any particular and to make him only such promises as you will be able to fully redeem, and see that he realizes as a personal experience every assurance you give him. A thorough knowledge of the subject, absolute truthfulness, and the exercise of a proper discretion are essential.

After having in this manner laid the groundwork for the corrective mental impressions which you wish to make on him, begin the eliminating course, purgatives, baths, etc. Explain to him the effect you expect from this eliminating course. Tell him that he has an enormous quantity of effete material stored in his system which this course of treatment will remove, and that as this is being removed the principal cause of his former trouble will go with it. Tell him that he will have the most copious discharges from his bowels that he has ever had, and that the removal from his system of this offensive excreta will very largely overcome the desire and necessity for his drug and will also prevent the development of the distressing diarrhea, colic, vomiting, heart complications, extreme nervousness, and many other of the painful symptoms which he has so fully described to you.

See that the purgative acts as it should and then you will be in a position to remind him that you told him beforehand you would give him a purgative that would

act freely and pleasantly, that the discharges would be very copious, etc., all of which he is now realizing to be true.

Note carefully every development in the case that supports the assurances and promises you made him, and thus make one step toward insinuating yourself into his confidence; make use of this opportunity to give such other assurances as you wish to impress upon him.

Note the fact that it is now several hours past the time for his accustomed dose, that he is not feeling the need of his drug, and that he is not anything like so nervous as usual when going beyond the time for his dose. Tell him that when he does begin to feel the need of his drug you will give him another remedy which will bring about complete relief; that you will continue to administer this remedy two to three days and then discontinue all medicines, and that he will then have no desire for his drug and be free and independent of it.

When elimination has been satisfactorily effected and the patient begins to feel the need of his drug, begin scopolamine. Give this as indicated, to keep him from suffering, but do not overwhelm consciousness, as you will need to make use of the semiconscious state produced by scopolamine to more firmly implant the suggestions you have heretofore merely intimated to him.

Scopolamine, if discreetly administered, produces a semiconscious or subconscious state similar to that known to psychologists as the "psychic state," in which the reasoning faculties are inactive and that part of the mind known as the subconscious mind is in control.

In this state the patient does not reason, but accepts as true and acts upon suggestions given him. This state should be made use of to fully disabuse his mind of any delusions, convictions, or ideas that he still has that

which would militate against his remaining free from the addiction and to implant such contrary or opposing ideas as are needed to make him a self-reliant, hopeful, independent man.

As the patient comes out from under the influence of scopolamine he will realize still further that the assurances you gave him are true. He will find that he is not nervous or suffering, as he expected to be. While you told him he would not be so, he could not accept your assurances, but now these are realized as true by his own senses, which he cannot question, and your words begin to have much greater weight with him.

He finds that his own experiences are hour by hour confirming every assurance you gave him, and he is thus forced to have confidence in you. For the next few days you should assiduously cultivate this growing confidence of your patient until you bring him to the point that he no longer questions anything you say, but will accept as absolute truth any assurance you give him. You will have thus step by step, but effectively, developed him into a "psychic" so far as you and your words are concerned.

By this time every assurance you have given him will probably have been verified, except the assurance that if he should become affected with any slight or even grave disorder other remedies will give him relief.

Watch your opportunity and, when complaint is made of any ailment, select the remedy that would give anyone else relief and administer it to him; at the same time assure him that it will relieve him, and, contrary to the general rule, tell him just what you are giving. In this way demonstrate to him the truthfulness of your words as to this matter also and fully satisfy him that other remedies will now have the same effect on him that

they do on others, and that it will not be necessary for him to again resort to the use of morphine for the relief of any ailment he may have.

Teach him that morphine is not his best or only friend, but that it is really his worst enemy and in every way possible prejudice him against its use. Fully convince him of his independence of the drug and send him from you a free, happy, self-reliant, independent man, instead of an abject, dependent slave, as when he came to you. Instead of being suspicious of all physicians and skeptical of the potency of all drugs, except his one, have him implicitly trusting in you and testifying to the efficiency of the remedies in ordinary use to relieve any ailment he may have.

You should project your personality into his life so fully and forcibly that you can and do control his mental state and send him from you with your mind and personality engrafted upon and dominating him. If this is well and skillfully done, these impressions will abide with him and control his conduct as completely as did the mania for his drug which these have supplanted.

The treatment of this disease is more than the practice of medicine; it is not only the scientific use of all proper therapeutic measures, but it involves also the bringing to your aid all the God-given qualities of mind and heart by which the life, conduct, and opinions of your patient can be affected, to the end that he may be sent out into the world an independent, self-reliant man mentally and physically healed.

CHAPTER XV.

A PLEA FOR A MORE JUST JUDGMENT OF NARCOTIC DRUG USERS.

When the author began the preparation of this chapter he intended its title to be "A Plea for a More Charitable Judgment of Narcotic Drug Users," but on getting into the subject more fully he saw that it is not charity that he should ask, but simple justice. Therefore, he enters a plea for justice and not for charity.

He hopes to show that thousands of the most wretched and helpless of all human beings are being constantly and openly stigmatized as degenerates, willful perverts, inveterate liars, and fiends, and are having numerous other epithets of reproach and condemnation heaped upon them for continuing a course of conduct to which they are impelled by forces that it is totally beyond their power to resist.

Whether an opium addiction is formed from necessity or as a dissipation, justifiably or unjustifiably, the condition finally becomes the same, and when the condition of confirmed addiction is reached it is as truly a disease as is typhoid fever, and the normal supply of the drug used is a necessity for the comfort and well-being of the victim.

Let us consider for a few minutes the condition into which an opium user is thrown by being deprived of his drug. Wilson, vol. v, Pepper's "System of Medicine," says:—

"Opium habitués, differing as they do among themselves as long as the drug is freely taken, all alike develop characteristic symptoms upon its speedy or gradual withdrawal. . . . The

nervous system, whether it has been accustomed for months only or for years to the influence of opiates, is, upon their withdrawal, forthwith thrown into derangements of the most serious and widespread kind.

"In the course of a few hours after the last dose, the steadying influence of the drug disappears. General malaise is associated with progressive restlessness; the ability to perform the ordinary duties of life gives way to profound indifference; precordial distress, accompanied by cough, is followed by insomnia, hallucinations, and sometimes mania. The habitual pallor of the face is replaced by a deep flush or cyanosis.

"The heart's action becomes excited or irregular, then feeble; the pulse, at first tense, becomes slow, thready, and irregular. Attacks of yawning and sneezing are followed by convulsive twitching of the hands. Speech becomes hesitating, drawling, and stuttering.

"These phenomena are associated with a sense of perfect prostration, which obliges the patient to take his bed. Pains in the back and limbs followed by neuralgia occur. Complete anorexia with easily provoked or even causeless vomiting and persistent nausea with diarrhea difficult to control add to the gravity of the condition.

"During the early days of the abstinence, the evidences of cardiac failure are marked. Enfeeblement of the first sound, irregularity of the heart's action, and intermissions are common. Restlessness is continuous and very often intense, and patients are with difficulty kept in bed. If left to themselves, they move frantically about the room, moaning and bewailing their condition and begging the attendant for that which alone is capable of relieving their distress.

"This condition gradually subsides, giving way to one of profound exhaustion. . . . The appearance of the patient is now most pitiable. The countenance is blanched and pinched, the body drenched with sweat, the heart action feeble, the pulse

thready and irregular. . . . Failure of the circulation may, notwithstanding every effort to control it, reach such a degree as to jeopardize the patient's life."

Erlenmeyer says:—

"The patient after withdrawal is left in such a condition of physical weakness and mental dilapidation as to be the victim of intolerable suffering. . . . He cannot sleep, has no appetite, often vomits, and feels too much used up to rise from bed. This condition grows worse from week to week. Various attempts to cure prove useless. Morphin is the only remedy."

Butler's "Therapeutics," p. 452, says:—

"The treatment of so dire a malady, for such the chronic use of morphin must be regarded, demands the utmost forethought, patience, and tact. The method of sudden, absolute withdrawal of the drug is admitted by the wisest observers to be fraught with dangers commensurate with that of the indulgence to be overcome. Collapse, insanity, and other serious results have attended so drastic a measure. The gravity of the situation should from the first be fully realized, since it is too often simply a case of life or death, the patient being not infrequently seized with the desire of self-destruction in the extremes of mental anguish occasioned by the ordeal imposed by unwonted abstinence."

Other writers of undisputed authority enumerate intolerable suffering, violent delirium, transient or permanent dementia, suicide, and death as occurring to drug users through being deprived of their drug supply.

Notwithstanding these clear and distinct teachings by men of unquestioned authority, the great majority of professional men regard the users of narcotic drugs as being willfully abandoned to a loathsome habit which they could discontinue if they would.

As a result of their holding such views the public has been taught to regard these victims as perverts who are devoid of moral courage and right purposes in life and who take their drug simply to dream away the time and who are unworthy of any treatment other than social ostracism.

The fact that such opinions are generally held among the people is a matter of common knowledge, and when one falls a victim to a drug, however strongly he may have condemned others for what he considered a voluntary, loathsome habit, he soon finds there is another side to the question.

Comparatively few persons form the opium habit voluntarily or as a dissipation. Usually it is formed inadvertently or because of the use of the drug for the relief of pain.

There are very few drug users who have not made many and often very desperate efforts to extricate themselves from the thraldom of the drug, or who have not, by some circumstance or other, been deprived of their drug supply. These efforts at abandonment or periods of deprivation have brought upon them the sufferings incident to the disuse of the drug, and these have proved to be so excruciating and intolerable as thoroughly to convince them that the voluntary abandonment of the drug is entirely out of their power: that what they once blamed others for not doing, they are themselves unable to do.

While such experience may have worked a radical change in their own opinions, they are well aware that public opinion—the irresistible moral force—has not undergone any such change. They are acutely, or possibly morbidly, sensitive to that fact, but they are not changed in their purposes in life, in their desire to have

and retain the respect and confidence of their friends and the public in general.

They still love life, and their good name is as dear to them as ever. They feel confident of their own integrity and good purposes, but they know that the drug has become a necessity to them. They also know that if their use of the drug should become known the blighting sting of public opinion would lacerate their very souls; therefore, in order to shield themselves from criticism and censure, springing from what they now know to be misguided public opinion, they procure their drug and use it in secret.

Thus they start out leading a double life, a life of deception, with a skeleton in the closet that must be kept constantly concealed from public gaze, but the motives which prompt them to that course are not dishonorable.

Self-preservation is said to be the first law of nature. A man is justified under the law in taking the life of his fellow-man when necessary to preserve his own, and in the protection of his good name, which to a right-thinking man is as dear as his life, very great liberty of action is allowed.

The acts that are held to be a perversion of character, manifested by many of these persons, are not due to the physiological effects of opium, or to any pathological condition induced by it.

The use of this drug does not, of itself, beget degeneracy. This springs largely, if not altogether, from another source. This is clearly shown from the fact that drug users who are independent of such influences maintain their integrity, sustain their good name, and retain the respect and confidence of their associates.

To illustrate this point the history of three cases is here given:—

Case I.—The patient is a druggist who has used morphine 18 years, running up in quantity during the time to 1.3 grams (20 grains) per day. He has during all that time continued to attend to his business, has been successful as a business man, has built up and held a large trade, and has himself done much of the prescription work and other delicate work connected with the business. His family and his physician knew of his addiction, but never at any time reproached him for it or tried to control him with reference to it.

The public had no occasion to know of it, or to be concerned about it, and therefore asked no questions. Being a druggist and independent financially, his drug supply was always at hand, and was taken at regular intervals, and in uniform quantities. In this way he kept himself in a fairly normal condition, and neither the public nor the people with whom he did business suspected his use of the drug.

A uniform supply of the drug was as necessary to keep him in a normal and comfortable condition as it would have been for any other drug user, but, being in a position to have entire control of the drug supply, and as his family made no objection to his course, and did not at any time attempt to stand between him and his drug supply, he was not forced to use deception or other questionable means to obtain the necessary thing. Being thus favorably situated, he was able to retain the confidence of his family and friends, and of the public at large.

Case II.—A case similar to the foregoing was that of a physician who became addicted to the use of morphine during a protracted attack of inflammatory rheumatism, and, after about six months' use of the drug for the relief of that ailment, the rheumatic symptoms subsided and an effort was made to discontinue the drug, but without success.

After a little delay, another effort was made with the same result. The suffering resulting from these efforts, with the necessary resort to the drug for relief in each instance, fully con-

vinced the doctor and his family that it was out of his power to discontinue it, and they all accepted the situation and looked upon his addiction as a misfortune for which he was in no way to blame, and from that time on, for more than twenty years, he continued the use of the drug with the full knowledge and consent of his family, but without his patrons or the public knowing anything whatever of it.

He kept an ample supply of his drug always at hand and used it in uniform quantities and at regular intervals, and during all these years he kept up an active practice, and held the confidence of his patrons and of the business public.

He was always an unwilling slave, and no element of dissipation was allowed to enter into his addiction. He bought the drug in tablet form, so as to be exact about the dose, and only took a sufficient quantity to keep him comfortable. In this way he succeeded in holding the dose down to 0.39 gram (6 grains) or less per day. On days when he had little to do he used not more than 0.26 gram (4 grains), but on other days, when there were taxing duties to meet and when his hours of work had to be prolonged into the night, as much as 0.39 gram (6 grains) was required to sustain him.

From his appearance or conduct, no one would ever suspect his being a drug user, and he was, when he came for treatment, in an active practice and holding a number of official positions in the profession. He was a man of intelligence and of fine family and character and very acutely felt his slavery. He said that he realized the drug was injuring him, especially his memory; therefore, he wanted to be released from its thraldom.

Case III.—Another of this type was a refined, delicate woman who had been given morphine for several months to prevent an abortion, and after her confinement she was unable to discontinue it. She made repeated efforts, with the assistance of her husband, to leave off the drug, but her condition in each instance became so critical that her husband would not consent

to her making further effort in that direction, and, instead of chiding her or blaming her for inability to leave off the drug, he bought it for her in sufficient quantities and told her to use it as she found it necessary.

She suffered from a number of ailments, which led to an increase of the dose to about 1.3 grams (20 grains) per day, but for several years no one knew of the use of the drug except her husband and her physician. Later her father and brothers were informed of it, and, as they had heard of the author's work in this line, they urged her to come for treatment.

When she was admitted her husband and brother gave a history of the case, her husband stating that he recognized it as a misfortune, for which his wife was in no wise to be blamed, and, since he realized that it was out of her power to quit it, he had kept her supplied with the drug, so that she had never been forced to obtain it in any other way or to resort to deception in regard to its use. He said that she had always been perfectly open and frank with him about the matter and that the use of the drug had not in the least rendered her unreliable or untrustworthy.

She was in the institution about six weeks, and was found to be entirely truthful and trustworthy, never at any time attempting to deceive, or indulging in extravagant or unfounded statements. In fact, she showed the same high sense of honor and exercised the same caution in statement and respect for her word that would be expected of a woman of refinement and culture afflicted with any other disease, notwithstanding the fact that she had been using morphine in considerable quantities for more than five years.

These are fairly representative of a large per cent. of drug users who come under the care of one engaged in the treatment of such patients. It is true that drug users of this class are almost unknown to the public and

are very little known to physicians in general practice, but they are not at all rare among those who apply for admission to institutions devoted to the treatment of such patients.

The mere use of opiates does not make perverts or moral degenerates of people who were of good character before the use of the drug was begun, and the fact that some such persons do retain their integrity and sustain their character and standing in the communities in which they live, notwithstanding the use of the drug, forces us to look elsewhere *than to the effect of the drug* for an explanation of the traits of character usually seen in drug users. Let us, therefore, study the history of a few other cases.

CASE IV is of a different type, but at the beginning her character and standing were first class. She was a member of a good family and married to a lawyer of prominence. She made an ideal wife, loved her home, and devoted herself largely to making it attractive to her husband. Something over a year after her marriage she became the mother of a fine boy, who was the delight of both father and mother, and for the next two years their home was an ideal one.

About this time another conception occurred. All went well until about the fourth month, when she was threatened with a miscarriage. The family physician was called, and it became necessary to confine her to bed and administer morphine for about ten days to prevent an abortion. She was then allowed to get up and a few days later the symptoms returned.

She was again put to bed and morphine was administered and this time continued for three weeks without the intermission of more than a full day. Morphine was then discontinued and she was allowed to get up, but in a few days the uterus became rebellious again and it was necessary to resume the use of the opiate.

By continuing the opiate from that time on, she was carried to her full term and delivered of a healthy child. She had both a perineal and a cervical injury at the confinement, which protracted her convalescence and caused considerable suffering, and the morphine was continued until the baby was two months old. By this time she had sufficiently regained her strength to be up and about the house. Her physician then told her that it would not be necessary to use the opiate, ordered it discontinued, and dismissed the case.

In about twenty-four hours her suffering became so acute that he was again called, but declined to give an opiate, insisted that her suffering was mainly imaginary, and told her husband that as soon as she found that she could get more morphine she would become quiet and quit complaining.

Her husband believed this and told her that he would not allow her to have more of the drug under any circumstances, and, leaving her with the servants, went on to his business.

As the addiction had been confirmed by more than six months' use of the drug, her sufferings increased until they became unbearable, and, realizing that she could not expect relief from either husband or physician, she sent a servant out and obtained a bottle of laudanum. A full dose of this gave her a fair degree of relief and when her husband came home in the evening she was more quiet and he felt that the doctor's word had come true and that they had, by their firmness, broken his wife from the use of morphine. But he was mistaken.

When the first bottle of laudanum was exhausted, more was obtained. This was used as sparingly as possible, and she made numerous efforts to leave it off altogether. Finding herself unable to do so, she continued it, and by discreet management used it for a period of two years before it was detected by her husband.

When he did become aware of it, he reproached her for it very severely, and again applied to his physician for advice in

the matter. The physician assured him that her use of the drug was a mere dissipation, a habit that could be abandoned at will, and advised that if she did not leave it off voluntarily she be compelled to do so.

Her husband urged her to leave off the drug, and she promised to do so, and did try faithfully, but, of course, she could not succeed. Her husband criticised her severely for her failure to keep her promises in the matter, and attributed to her all kinds of evil purposes.

Finding that these did not avail, he determined to cut off the drug supply. He deprived her of money, and notified all the druggists in his town not to sell her on credit, and urged them not to sell her opiates at all.

This made it necessary for her to resort to many expedients to procure her drug, and even then she was not able to obtain it regularly. When she could not obtain the drug by other means, she would sell her clothing to negroes and get them to buy the drug for her. Another plan was to order groceries and sell them at reduced rates to get money to buy the drug.

At times she was unable by any of these means to obtain her drug supply, and at such times she would secure whisky and drink that. This, of course, disgusted her husband, and his position became one of extreme bitterness toward her. The wife realized that it was out of her power to comply with her husband's wishes and discontinue the use of the drug. The intense suffering that came on when she was out of her drug became an impelling force, which compelled her to do almost anything to obtain that which alone was capable of giving her relief.

The position occupied by her husband and her physician was so extreme, and they so totally misunderstood the necessities of her case, that there could be no common ground of agreement between them. They felt that she was pursuing that course from preference, as a deliberate choice; that she had lost all respect for herself and for her family and had become totally depraved, and they treated her accordingly.

She was conscious of her faithful efforts to comply with their demands, but was also painfully conscious of the fact that it was out of her power to break the fetters that held her a slave to the drug. Strive as she would, she could not do so.

Much as she desired to regain the confidence and love of her husband, the unbearable suffering experienced and the extreme desperation brought on by failure of her drug supply impelled her as an irresistible force to turn a deaf ear to all their entreaties, to disregard all promises made to them as to leaving off the drug, to smother all motherly and wifely instincts, if need be, and to continue to resort to all forms of deception and intrigue that were found necessary to obtain her drug supply. It had, in her experience, become the one supreme necessity of life.

CASE V.—D. G., a young man aged 18 years, was given morphine seven months during an attack of rheumatism. At the end of that time the rheumatic symptoms had disappeared, and his father, who was a physician and had attended him, decided to withdraw the morphine by gradual reduction, and began to do so.

Things progressed fairly well for a time, but after the dose had been cut down considerably the suffering of the patient was extreme. The father had mapped out a plan which he felt he must not vary from. The son suffered intensely for a number of days, but all his pleadings for something more to relieve him were ignored. His father told him he would rather see him a corpse than have him continue the use of morphine, and insisted that the course he was pursuing was the only one that promised relief, and that he must stand the suffering.

The reduction was continued until the last of the drug was withdrawn, but the condition of the patient was most desperate. He could not sleep, had no appetite, was extremely nervous, had an exhausting diarrhea which nothing seemed to benefit, and in many other ways his suffering was unbearable.

In this extreme condition the son, by the aid of a friend, secured a supply of morphine tablets. These were used very

sparingly, and only enough to overcome the most acute suffering, the young man feeling that if he could only get a little relief he could bear the balance of the suffering and finally get off the drug, which he was very anxious to do.

The father noticed the improved condition of the son, and felt that he was succeeding in curing him of the addiction. In a few months, however, the son's efforts to hold the quantity down and to keep his use of it concealed were unavailing, and the father learned of it. He was very much incensed at what he termed his son's willful disobedience and deception.

He then determined to punish him and cure him at the same time, so he took the drug supply away, put an attendant with him, and locked him in his room.

Here for the next three days he suffered the tortures incident to the abrupt withdrawal of the drug without treatment, and by the end of that time his condition was so critical that the father became alarmed and gave morphine for relief. This was continued for a few days, and then another effort was made to withdraw it, but the symptoms became alarming again and the drug was resorted to. The next year was spent in one effort after another to break up the addiction, the father often resorting to harsh means and even cruel treatment in his efforts to force the disuse of the drug.

This only served to widen the breach between the father and son, and to drive the son to more desperate means to obtain the drug supply. He would steal his father's books or instruments or anything else that he could take from the house without being immediately detected, and sell them to obtain the drug. If he could not get morphine, he would get whisky or any other drug or drink which would to any degree fill its place. His father looked upon these acts as positive evidence of extreme perversion, and regarded him as utterly abandoned and hopeless.

The last two cases are representative of a large per cent. of the drug users in the United States. They

present a sharp contrast when compared with the first three cases reported in this chapter. Between them there are all grades and varieties, and, while they all use the drug in common, they differ radically in other respects, but it is evident that the traits of character manifested by many of them are not due to the effect of opiates.

In studying the history of a large number of patients who were unquestionably of good character prior to the formation of the addiction, the author has found that the perverse traits of character were prominent or not just in proportion as the other influences herein mentioned were prominent or not.

If the addiction was formed by one who was entirely independent and could secure and use the drug without being interfered with by anyone, he retained his integrity, his business and social standing, etc., to a fair degree, but when the habitué was dependent on someone else for his drug supply, and this one a person who did not understand the necessities of his condition, or when his family or friends, or those to whom he was subject, undertook to break the "habit" by withholding the drug supply or the means of obtaining it, or when adverse fortune made it necessary for the drug user to resort to deception and other such means to procure the drug, the perverse traits of character were very prominent.

These perverse traits were present in proportion to the length of time and the degree of intrigue and deception the drug user had been forced to use.

The conclusion is inevitable: that in the fourth case herein reported the failure of the husband and physician properly to understand the condition of the patient and to provide the relief the condition demanded forced her, in the first place, to begin a life of deception, and their

harsh criticism and unjust treatment caused her to continue to pursue a course which they could only look upon as one of extreme dissipation.

The same influences were responsible for the conduct of the patient in Case V. The mistaken views held by the father led to the son's wretched condition.

No greater mistake was ever made by well-meaning persons than to attempt to deprive of his drug supply one who is addicted to the use of morphine. Such efforts only serve to drive the drug user to secret and often immoral acts to procure his supply.

The only proper and reasonable course is to recognize the condition as a misfortune—a disease, as it really is, and one which cannot be overcome by merely depriving the patient of his drug. It should also be borne in mind that it is a really hazardous proceeding to deprive a drug user of his drug supply, since dementia or death may be the result.

Another case will illustrate still another phase of this subject:—

Case VI.—C. H. T. belongs to a different class. His parents were in moderate circumstances, but lived in a crowded city district, where the son formed acquaintances that were anything but desirable. At 16 he began to drink and gamble, declined to continue in school, and set out to make his own living.

His ideals were low and, having no well-defined purpose, he obtained employment first at one thing and then another, but painting seemed to be his preference, and by the time he was 20 he had developed considerable skill as a house and sign painter. This enabled him to earn good wages and furnished him means with which to buy liquors.

He would work faithfully for a few weeks, but as soon as he accumulated a little money he would go on a spree and not stop until his last cent was spent and his credit exhausted. His money

being gone, the saloons would no longer shelter him, and he was frequently taken in charge by the police and sobered up under their care.

At other times he would apply to physicians for something to quiet his nervousness and enable him to sober up. This something too often proved to be morphine given hypodermically. This had, to him, a most delightful effect, bringing quietude to his shattered nerves and rest to his excited brain. He soon learned that under the influence of opiates the demand for strong drink was much less urgent and that he could control himself more fully than when using whisky alone.

Being a venturesome creature, he learned the use of the hypodermic syringe and this led to the daily use of the drug. Things progressed fairly well with him for the next year, as he used much less whisky, but as he became more and more dependent on the drug his capacity as well as his inclination for work declined. His income decreased until it was not sufficient to support him and supply the drug he was using.

He then began to resort to various expedients to procure his drug. He borrowed from friends until his repeated failures to repay forced them to refuse further loans.

His next resort was to besiege the offices of physicians with some feigned complaint and beg them to give him the drug, but physician after physician, tiring of these calls, turned him away without further assistance. Then being more desperate, he began to beg on the streets, and, when these appeals did not bring the necessary funds, larceny of any article that he could pawn for a small amount was resorted to.

These thefts brought him into prominence in the police courts and the accounts of his peculations in the papers brought his case to the notice of thousands of people. When he would become known to the people of one town as a chronic beggar and they no longer responded to his appeals, he would make his way to another town, and there under new surroundings he would, for

a time, be more successful in obtaining assistance from physicians and from the public. But sooner or later he would be brought before the public as a morphine fiend who had committed some crime, almost always petit larceny. Later on his thefts became more frequent and of greater magnitude, and he is now serving a term in a State prison for grand larceny.

It will be noticed that this man was reared under rather unfavorable surroundings, that he began to dissipate early, had no very high ideals or well-defined purposes, and that morphine was added to the use of whisky more as a dissipation than otherwise.

This case belongs to a class that forms probably 15 per cent. of all drug users, certainly not more than that, but, while they are comparatively few in number, they have made a reputation for the entire generation of drug users.

They are the ones who have been constantly before the public gaze; they are the ones with whom physicians have often come into unfavorable contact, both at their offices and at the public institutions, and both the public and the profession have come to look upon them as fairly representative of the entire multitude of drug users. Their crimes and other acts of perversion have been so repeatedly brought to the public notice through the press and the courts that the public has been taught to look upon all narcotic drug users as of this class, when, in fact, this is very far from the truth.

One drug user of this class will often be brought to the notice of many thousands of people in an unfavorable light, while there are in the same population hundreds of other drug users who conduct themselves discreetly and never expose themselves to the public gaze. Many of these doubtless compare favorably in character and

standing with the first three cases reported in this chapter; yet, the state of public opinion is such that if their use of the drug were known they would be classed with the perverts and stigmatized as "morphine fiends."

As a result of attributing the perverse traits of character manifested by some morphine users to the effects of the drug, both the profession and the public have fallen into the error of looking upon all opium users as of the same class, and, since the comparatively small number of perverts among them are the ones who have become most commonly known, they have made the reputation by which all are judged.

Such a conclusion is erroneous, and the opinion based upon it is manifestly unjust. Drug users differ from each other as greatly as do other people.

Some of them retain their moral character, their veracity, and even their reputation without blemish, while others become moral wrecks, but it is evident that other influences besides the effects of the drug are potent factors in bringing about that wreckage.

If the reader will recall for a moment the condition into which a drug user is thrown by being deprived of his drug, as described at the beginning of this chapter, he will doubtless admit that it is unreasonable to expect any human being to enter upon such an undertaking voluntarily, or to submit to being forced into it, if it is in his power to prevent it.

The author does not hesitate to say that an opium user has a moral right to resort to any course of conduct that may be necessary to obtain his drug supply.

If that course of conduct should embrace untruthfulness, deception, and fraud, it does not place him on the same moral plane with persons guilty of the same acts when the motive which prompts them is gain, personal advancement, or other such motive.

In resorting to such acts for the purpose of obtaining a drug supply, if it cannot be otherwise obtained, the drug user does only what any other human being would do under the same circumstances, and no one should be condemned for doing that which anyone else would have done.

Every drug user firmly believes that if he were deprived of his drug supply he would either die or go crazy, and he therefore feels justified in doing anything that may be necessary to protect himself from such an extremity.

Most morphine users deny their habit, and on that account they are charged with being notorious liars and unreliable in all matters.

Here, again, they are judged with undue harshness. They deny the use of the drug in self-defense, to try to preserve their good name and to protect themselves from the criticism and censure of their friends, and from the sting of misguided public opinion.

Since the motive which prompts an act fixes its moral quality, they should not be so strongly condemned for denying that which, if admitted, would ruin their business and social standing, and convict them in the eyes of the public of being willful perverts or moral degenerates, and lead to their being known and spoken of by the inhuman epithet "morphine fiend." If self-preservation is not the first law of nature, it is one of the strongest, and it is a just and proper motive for human action.

The conduct of persons such as is described in Case VI of this chapter has created another impression, both among the profession and the laity, which is without foundation. That is, that drug habitués are not curable, that they have no desire to be cured, and would not remain free from the drug if they were cured.

This is totally without foundation when persons such as are noted in Cases I, II, and III above are concerned. Drug users of this class long to be free from the drug and never give up hope of, in some way, securing freedom from it. All that is necessary to effect permanent cures in such cases is to give them a chance. When they are taken off the drug and put in such physical condition that they can live in a fair degree of comfort without it, *there is no tendency whatever to return to its use.* Fully 90 per cent. of such persons, when once really cured of the addiction, will remain permanently free from it. They will suffer any kind of torture before they will allow an opiate given to them.

This would be true of persons such as are described in Cases IV and V if they were properly handled early in their addiction, but, after they have been subjected to the tortures of physical suffering and the mental anguish which they must experience from the harsh and cruel treatment meted out to them by those from whom they would naturally look for kindness, sympathy, and love, they often pass the stage at which they could reassert their self-control, even if brought into a physical condition to do so.

The discouragement incident to the breaking up of family ties, the consciousness that their loved ones have lost confidence in them, affects them so unfavorably, so undermines their confidence in humanity, so completely robs them of hope, that they have not the courage to face the world and to take up the duties of a normal life. Such persons feel that they have nothing to live for, and, even if they are cured and put in perfectly normal physical condition, they are not secure from relapse.

The failure of physicians to permanently benefit patients of this class whom they have usually undertaken

to treat in the wards of general hospitals, furnishes the grounds for the opinion, generally held among physicians, that permanent cures are not to be expected in drug addiction. This opinion is totally without foundation with reference to fully 50 per cent. of drug habitués and is subject to material modification in the remainder.

CHAPTER XVI.

CONGENITAL MORPHINISM, WITH REPORT OF CASES.

CONCEALED MORPHINISM IN PARTURIENT WOMEN.

CONGENITAL morphinism is a rather rare condition. Comparatively few opium-using mothers conceive and fewer still of the children born of such mothers live beyond the third day after birth. This high mortality among the infants of such mothers is not unavoidable, but, managed as they usually are, a large majority of children born to such mothers die on the second or third day after birth.

This is due to the fact that the child's blood and tissues are as fully saturated with the narcotic as are those of its mother; in fact, so far as the physical elements of the addiction are concerned, the child is as much an habitué as is its mother. Severance of the placental circulation, through which the child had been receiving the narcotic, shuts off that supply, and, if the drug is not administered to the child, it suffers the shock and collapse incident to the abrupt withdrawal of opiates from an habitué.

Few adults are able to stand such a strain; therefore, a newly born infant could not be expected to do so. Some infants born under such conditions, however, are managed so as to preserve their lives and a few of them have come under the author's care. Note the following cases:—

In May, 1901, W. T. B. and wife came for treatment for morphinism, bringing two children with them. One

a boy 3 years, the other a girl 1 year, of age. The mother was using morphine before the first conception and when the baby was born it was fortunately under the care of a physician who realized the danger of the sudden withdrawal of an opiate from such an infant, and he gave paregoric in full doses for the first three days and then the baby was put to the breast and allowed to get its drug supply in that way.

When this child was a year old an effort was made to wean it, but it was very fretful and suffered so severely that the mother says she did not have the heart to deny it the breast and it was allowed to continue to nurse. Notwithstanding this, however, and notwithstanding the fact that she continued to use the opiate and that menstruation was absent, she conceived again and the girl was born two years after the boy.

This child was managed in the same way as the first for the first few days after birth and then both children were allowed to nurse. They both received their narcotic through the milk and the mother had not succeeded in weaning either of them. Therefore, they were brought with her for treatment.

The mother and children were prepared for the withdrawal of the opiate by active elimination, the opiate was discontinued, and they were given the usual treatment, the children taking the same remedies as the mother, but in relatively smaller doses. The children stood the treatment as well as the mother and all were brought out in good condition in a short time.

Neither of the children were allowed to nurse after the treatment. The mother was much emaciated from the drain of nursing the two children, but her convalescence was rapid after the children had been weaned and both the mother and the two children have remained free

from their addiction. The children are healthy and vigorous and show no evidence of their former addiction. It has been now a little over ten years since these cases were treated.

In Nov., 1909, a Texas physician wrote, asking advice as to the management of his wife, who, he said, was addicted to the use of morphine and was about seven months pregnant. Not being able to find anything in medical literature to guide him in the management of such a case, he wished the author to give him such aid as he could. Had the patient been near the author she would have been taken off of the drug even at that advanced stage of pregnancy, but a long railroad journey for such a patient made another course more expedient.

The author wrote, expressing the opinion that the patient could be carried through her confinement without complication, and advised that the use of the opiate be continued without any effort at reduction. Attention was also called to the importance of keeping up active elimination both by bowels and kidneys during the remainder of gestation and suitable remedies were suggested for that purpose to the end that the patient's system be kept in the best condition, and that she be as nearly free from toxic matter as possible at time of her confinement, the only complications likely to occur being of toxic origin.

These suggestions were faithfully carried out, and Dec. 30th she was delivered of a healthy child, at full term, in a normal labor.

Six hours after the delivery, the child began to show signs of restlessness and discomfort, and following the plan outlined it was given a drop of laudanum and this was repeated in half an hour. This did not give relief, and one hour later 2 drops were given at one dose.

This gave relief and the baby was quiet for several hours, but when it began to show signs of discomfort again, 3 drops of laudanum were given at one dose.

This proved to be a fairly effective dose, and a dose of this size was given every six hours for the next two days. By this time the milk flow was fairly well established, but the supply was not abundant and the child did not get as much narcotic through the milk as it had been accustomed to before birth, and it was found necessary, in order to keep the child free from abstinence symptoms, to supplement it by the administration of 2 drops of laudanum three times a day.

When the child was a few weeks old an effort was made to discontinue these doses and depend upon the supply from the milk alone, but the child was very fretful and restless when these doses were not given, so it was thought best to continue them until the mother and child could be sent for treatment. This was done when the child was two months old.

Upon admission the mother was found to be using about 10 grains morphine daily; the infant was nursing and receiving, in addition to the quantity it obtained from the milk, from 6 to 9 drops of laudanum daily. Both were prepared for withdrawal by thorough elimination, devoting three days to this part of the treatment, and the opiate was discontinued at once in both cases.

The mother was kept under the influence of hyoscine to a moderate degree for a couple of days and the child was allowed to continue to nurse. Within six hours from the time the administration of hyoscine to the mother was begun, the child showed distinct signs of the effects of that remedy, but it was fretful and manifestly uncomfortable. At this time a dose of $\frac{1}{1000}$ grain hyoscine was given to the baby, and this dose was re-

peated every four to six hours for the succeeding thirty-six hours.

By the end of the third day from the withdrawal, both patients were fairly out from under the influence of hyoscine and all other remedies and were comfortable. On the fourth day their condition was still more satisfactory, and, from that time on, their convalescence was normal and uninterrupted. Neither of them suffered during the treatment to such a degree as to show it.

The doctor, the husband and father, writes under date of Nov. 4, 1911, saying that both mother and child are in good health and free from their addiction. He sends picture of the little girl, who is now a hearty, robust child of 2 years

Every child born of an opium-using mother should be given an opiate for the first three days after birth. After that the milk may be depended upon to contain enough of the drug to satisfy the demands of the child's system, or, if it is thought best not to allow the child to nurse, the administration of the opiate should be continued until such time as the child is strong enough to stand the withdrawal. By this means their lives can be preserved.

The quantity of opiate which the child will require to relieve its distress and to bring it up to what to it is a normal condition will vary according to the quantity of drug which is being taken by the mother. The child's blood is as much saturated with the narcotic as is the blood of the mother, and the nerve-centers have acquired the same proportionate degree of tolerance for the opiate that the mother's nervous system has.

The relative size of the dose, however, will not hold good if the mother is taking more than 10 grains of morphine per day. It is not believed that the system

will really appropriate more than 15 or 20 grains of morphine per day at the outside, and probably not much over 10 grains. What is taken in excess of that amount is really thrown off as waste and makes but little, if any, impression on the nervous system.

A drug habitué who is taking regularly, and whose system has become accustomed to the effects of, as much as 20 grains of morphine per day could inject almost any quantity above that with impunity. However, if the mother is taking only a few grains, or even 1 grain, of morphine daily, the child's system will be equally as toxic from its effects as that of the mother and the drug will be as much a necessity to its comfort as it is to the comfort of the mother.

While it will not require so large a dose for a child born to a mother who is using only a small quantity of opiates per day, the opiate is necessary to its comfort and its administration should be begun as soon as abstinence symptoms make their appearance. It is a safe rule to begin with 1 drop of laudanum and repeat at intervals of one-half hour until the child shows the effects of the drug, either by being put to sleep or being relieved from the distressing abstinence symptoms.

The time that these symptoms may be expected to show themselves will depend upon the frequency with which the mother has been in the habit of taking the doses of her drugs. If the mother is taking but one dose of opiate in twenty-four hours and the child is born a few hours after she has had her accustomed dose, of course, its blood will have in it the proportionate quantity of the opiate, and this will continue to keep the child quiet until the time, or probably a few hours beyond the time, for the succeeding dose to which the mother has been accustomed.

But should the child be born just before the time for the mother's accustomed dose, it is evident that her blood and her system, as also that of the child, would be fairly well out from under the influence of the dose taken, say, eighteen or twenty hours, or probably twenty-three hours, before. In this case the child would begin to suffer from the abstinence symptoms within a very short time after delivery, notwithstanding only one dose of morphine had been taken by the mother during each twenty-four hours.

This condition should be inquired into, and, if the mother has taken her accustomed dose only a few hours before the severance of placental circulation, no opiate will be required for the child until the succeeding time for the mother's dose; then it should be given the child, as well as the mother.

Again, the frequency with which the child will require these doses will depend upon the frequency with which the mother has been accustomed to taking the drug. The child's nerve-centers have been accustomed to the same periodic narcotic sedation which the mother has been subjected to, and these periods have become fixed in its life to such a degree that if the narcotic impression to which it has thus been accustomed is not kept up the child will suffer abstinence symptoms, just as the mother would if she did not receive her accustomed dose at the time she had been taking it.

These periods should be observed in the administration of the drug to the child, as well as the mother, as any attempt to interfere with them at this stage would result in serious illness of the child. When the child is two or three months old, both the child and mother may be safely taken off the drug by proper treatment, but no effort at withdrawal or even reduction of the drug

should be made during the parturient month, either in the case of the child or mother.

The results obtained by two mothers who have come under the author's care show the importance of administering an opiate to the child from the time of birth until the flow of milk is established.

Mrs. M. J. came for treatment May, 1910. She had been taking McMunn's elixir of opium thirty-one years. Is the mother of eighteen children; only the first two and the last one lived beyond the third day after birth. The first two children were born before she became addicted to the opiate. During the third pregnancy she was threatened with miscarriage and McMunn's elixir of opium was given to prevent it. During the last half of the period of gestation, the opiate was administered to her two or three times a day, and, while it served the purpose of preserving the pregnancy, it also fastened the opium habit upon her and she was not able to throw it off.

The child was fully developed and apparently perfectly healthy, but on the day following its birth it began to show signs of illness and it grew progressively worse and died forty-eight hours after delivery in convulsions. Neither the physician in attendance nor the mother understood the necessity of giving the child an opiate, and none was given; the death was attributed to unknown causes.

This pregnancy was followed by another within fifteen months, in which she was confined under the same management, with death of the child within three days after birth, and this pregnancy by another and another, until this woman had given birth to fifteen children while using an opiate habitually.

All the children died within three days from their birth, most of them dying by the end of the second day.

The same physician attended her in all these confinements, and both the mother and the physician looked upon the death of the children as a natural consequence of the mother's condition and inevitable.

In her last confinement she was attended by another physician, who appreciated the conditions under which the child was being brought into the world and understood the necessity of protecting it from the shock incident to the abrupt withdrawal of the opiate. In order to do this he gave paregoric in 10-drop doses and these were repeated at such intervals as was found necessary to keep the child comfortable and free from abstinence symptoms.

The child was not allowed to nurse, but the paregoric was kept up for a few months and then gradually discontinued. This child is now a stout, healthy boy of 13 years, and the mother is firm in her belief that, had the same course been pursued with her other children, they would have lived also. They were all well developed and apparently normal children and showed no signs of illness or discomfort during the first twelve hours after birth, but, from that time on, their illness grew rapidly and they either went into complete collapse or died in convulsions by the end of the third day after birth.

Another case, treated in 1911, gives a history which in some particulars is very similar to the above, while in others it differs greatly. This woman, Mrs. C. J. D., had been using morphine by the mouth forty-five years; during most of that time she had taken with regularity 20 grains of morphine per day. She was married in 1863; first child in 1864, premature, at sixth month of pregnancy.

A second pregnancy soon followed, which resulted in miscarriage at third month. The third pregnancy

occurred in 1866. Miscarriage was threatened at second month and morphine was administered to preserve the conception. This was used occasionally to relieve symptoms for the first few months, but before gestation was completed the drug had been used daily for more than three months, by which the morphine addiction was established, but she was carried to full term and delivered of a normal child.

The mother says that, either from intuition or upon the advice of the midwife who attended her, paregoric was administered to the child when it became fretful, and this was kept up for several months before it was entirely discontinued; the child lived to be a grown woman.

After the mother's recovery from this confinement an effort was made to discontinue the use of the morphine, but without success, and its use has been continued from that time on.

As she did not allow this child to nurse, another pregnancy occurred within a year, and this was followed by others in rapid succession until eleven children had been born to this morphine-using mother. She went to full term with all of them and none of the children died in infancy; six of them are now living, and none of them show peculiarities which could be attributed to the condition of the mother at the time of their birth.

The same course was pursued in the case of the last ten children as in that of the first one that lived. An opiate was administered to them on the day following their birth, usually about twelve hours after birth. The mother says that about twelve hours after birth they began to show signs of discomfort and, as she understood what these symptoms meant, she administered an opiate, and this was repeated at such intervals as was

found necessary, and after the babies were a few months old the opiate was discontinued by gradual reduction, and this was usually done without very much difficulty. None of the children were allowed to nurse.

One unique feature of this case is that no menstrual flow occurred after the third pregnancy; at that time the morphine addiction became established, and the ten conceptions following that occurred without the appearance of menstruation at all. As a rule, the habitual use of opiates arrests menstruation, but from these cases it is quite evident that it does not always arrest ovulation, if, indeed, it does so at all.

The earlier writers on drug addiction assert that the habitual use of opiates not only suspends menstruation, but arrests ovulation as well. This opinion was evidently erroneous, as it is now known that several hundred children are born annually, in the United States alone, to women who use opiates habitually. The lives of these children can be preserved by following the plan herein outlined, but without such precautions very few of them live.

CONCEALED MORPHINISM IN PARTURIENT WOMEN.

When a child is born of a woman whose habits are not known and the child appears to be healthy and normal in every respect at birth, but in the course of six to eighteen hours afterward begins to show signs of discomfort, the symptoms taking the form of gastro-intestinal disturbances, with embarrassed portal circulation, which symptoms grow progressively more noticeable from hour to hour, concealed narcotic addiction in the mother should be suspected and evidence of the existence of such condition diligently searched for.

Narcotic addiction in the mother will often be found to explain this sudden, and otherwise-unaccounted-for,

illness of the infant. When this condition of affairs is suspected, although the mother may not admit it, it is well to give the child an opiate, say, 1 drop of laudanum. If this shows less than the normal effect, repeat it in half an hour, watch for effect again, and if not seen repeat again, and continue to do so until the child is brought fairly well under the influence of the opiate, or until it is restored to the apparently normal condition which existed for the time immediately succeeding its birth.

If the child is found to have an undue tolerance for the opiate or if its effects restore an apparently normal condition instead of inducing narcotic sleep, the existence of narcotic addiction may be accepted as a fact and the case handled accordingly. If it is a narcotic case, as the effects of the narcotic administered begin to wane, the symptoms of distress will again make their appearance and nothing but a narcotic will relieve them. This should be given as in cases where addiction is admitted. Few mothers, however, will be found to stubbornly persist in denying their real condition when they are made to realize that the life of their child may depend upon their making their real condition known, at least to the attending physician.

CHAPTER XVII.

THE TREATMENT OF ACUTE AILMENTS OCCURRING IN PERSONS ADDICTED TO HABITUAL USE OF NARCOTIC DRUGS.

THE fact that death is almost certain to be the result of an acute ailment such as typhoid fever, pneumonia, or dysentery when these ailments occur in one who is addicted to the habitual use of a narcotic drug suggests an inquiry as to the reason for this high mortality.

Every internist is occasionally called upon to treat acute ailments of various kinds occurring in persons addicted to the use of narcotics, and in such persons these ailments present some very knotty problems, which they do not present when they occur in persons not so addicted.

Therefore, it is well to ask in what way and to what extent does the habitual use of the narcotic modify the acute ailment? Does it increase or decrease its severity? To what extent and in what manner will the habitual use of the narcotic modify or interfere with the action of the remedies used in the treatment of the acute ailment? How will it affect the prognosis? Shall the narcotic be continued or withheld during the treatment of the acute ailment? If continued, how? If discontinued, how is that to be done?

These, as well as other equally perplexing, questions confront everyone who is called upon to treat patients of this class when attacked by an acute ailment, and his success in such an undertaking depends on his ability to solve these problems.

In order to find answers to these questions it is necessary to consider the effect morphine has on the system.

At the very beginning of its use, the first dose brings about a state of quietude or torpor accompanied by the diminished excretions of the products of waste. In the course of from twelve to twenty-four hours, these effects of the drug subside and the functional activity of the system becomes normal.

Or, possibly excretion is carried on at an accelerated rate, but it requires several days for this increased activity of the excreting organs to free the system from the products of waste which should have been excreted during the time these functions were restrained by the effects of the narcotic.

Now, if before this is accomplished another dose is taken, the eliminating organs are again interfered with in their work, resulting in retention of the product of waste. In the drug habitué these doses are repeated from day to day, usually several times a day, thus constantly interfering with the work of the excreting organs, and the system soon becomes surcharged with the product of tissue disintegration and their fermentative compounds. In other words, the habitual condition, the normal state as it were, of the drug habitué is one of profound toxemia. These toxins are of intestinal, drug, and auto- origin.

Any acute ailment occurring in one whose system is in such a toxic condition is greatly intensified. Fever, pain, and all other symptoms are increased in severity, and if the attack be of an inflammatory type the inflammation is likely to partake of an erysipelatous nature and spread with great rapidity. In all such cases the prognosis is extremely grave.

The treatment of such a condition is manifestly difficult, since the narcotic drug must be continued. If the drug could be discontinued the eliminating organs could

be readily brought into play and the toxic matter thrown off, but any attempt to withdraw the drug at the beginning of, or during, an acute ailment would precipitate a crisis which would almost certainly end in death.

Therefore, the physician is confronted with the necessity *of curing the acute ailment, of overcoming a diseased condition, while its cause continues in active operation.* Not only that, but if the patient is left to his own volition in the matter he will take his drug in increased quantities in order to partially overcome the distress incident to the acute ailment, and this would still farther retard secretion and excretion.

In order to have a rational basis for the application of the therapeutic measures with which to combat this condition, a conclusion should be reached as to which of the excreting or secreting organs is materially interfered with and what is the extent and character of that interference.

The action of the kidneys is not materially affected, since about as large a per cent. of urea and other excretory products are thrown off by the kidneys of the drug habitué as by a normal person and the quantity of liquid passed is practically normal.

The action of the peptic and pancreatic glands does not seem to be materially affected. A morphine habitué can digest and assimilate as large a quantity of nourishment under the effects of morphine as he can without it, if the system is in equally toxic condition from any other cause. In other words, while they are anemic and their tissues are poorly nourished and digestion and assimilation are interfered with, these interferences are due to the toxic condition of the system rather than to any direct effect that the morphine has on the digestive organs themselves.

The action of the liver does not seem to be materially affected. Drug users are able to eat and digest fair quantities of fats, and bile may be found in the stool. Since it is not apparent that the action of either of these classes of secreting and excreting glands is affected to such a degree as to account for the extremely toxic conditions present, is it to be presumed that the remaining set, the excreting glands of the intestines, are entirely at fault?

Not necessarily. Their action is regulated by the same nerve-centers which preside over the activity of the other intestinal glands. Their action could hardly be suspended to such a degree as to account for the toxic condition present without more marked derangement of the other glands having the same nerve supply.

This leaves the blame to rest on the other excretory force, the motor function of the bowel. *It is here that the chief trouble is found.*

One of the earliest and most noticeable effects of morphine is to arrest intestinal motion. In a very short time from the administration of a full dose of morphine peristalsis is completely arrested and remains absent for a period varying from four to twelve hours, depending upon the size of the dose.

In drug habitués these doses are repeated at frequent intervals and peristalsis is suspended during a greater part of each twenty-four hours. *Peristalsis is essential to the discharge of waste from the bowels. A motionless canal means a clogged canal.* The eliminating organs may be likened to a sewer system, with the intestinal canal as the *main* and the ducts of the excreting glands as the *laterals.*

Since the laterals cannot discharge their waste into an already overfilled main, it is retained or forced back

into the system. The reabsorption of this waste from the clogged or sluggish excreting stream is the mechanism by which the system of the drug user becomes toxic. When this semiparalyzed condition of the intestinal canal is overcome and active motility established in its stead, the accumulated waste is promptly discharged.

The fact that when active peristalsis is induced and maintained very little, if any, larger quantities of the secretory stimulants are required to secure free movements from the bowel of a drug habitué than from one who is not using the drug confirms the author in the belief that the functional activity, *per se,* of the secreting and excreting glands is not materially reduced, but that the failure of excretion arises almost exclusively from suspension of the motor function of the bowel.

Fortunately, there is one drug in our armamentarium which has sufficient power to bring about free intestinal motion notwithstanding the restraining effects of the opium, provided it is given in sufficient doses and at the proper time.

That drug is strychnine. Ordinary medicinal doses, however, are not sufficient. In estimating the quantity of strychnine required in any given case, age, weight, and physique of the patient must be taken into consideration, as well as the quantity of morphine, the paralyzing effects of which are to be overcome.

Young persons are more susceptible to strictures than older ones. The short, compactly built in whom a fair degree of muscular tone is present do not require as much as the tall, loose-jointed with flabby tissues, but the relation between the time of giving the strychnine and the morphine, the effects of which are to be neutralized, is equally as important as the size of the dose.

Strychnine excites peristalsis by direct stimulation of the motor centers. Motor waves thus induced extend to

all the structures which would receive them if the centers were acting normally or without artificial stimulation.

The arrest of the intestinal motion by morphine is most marked during the primary effect of each dose, but, as the primary effects of the drug wear away, peristalsis gradually becomes active. Drug users, as a rule, take their drugs only during the day, or from the time of rising in the morning until bedtime, say, from 8 A.M. to 10 P.M. During these hours the system is kept constantly under the primary effects of the drug, and intestinal motion is very much restricted, but during the period between 10 P.M. and 8 A.M. the effects of the day's dosing wear away, and peristalsis becomes fairly active. It is during the latter part of this period that the excretory organs do the principal part of their work.

In order to secure prompt action of purgatives advantage must be taken of this state of affairs. The remedies must also be so compounded and be given at such times as to have the acme of their effects, both as motor and secretory stimulants, occur during that part of this period when the system is least under the restraining influence of the opium.

To do this, begin with a purgative course at 2 P.M. and give on an empty stomach a dose every two hours until 10 P.M. For an average person taking 5 or more grains of morphine per day, the following will be found effective:—

℞ Calomel,
Extract of cascara .....āā gr. x.
Ipecac ..... gr. j.
Atropine sulphate ..... gr. $\frac{1}{50}$.
Strychnine nitrate ..... gr. $\frac{1}{4}$.
Mix and make 5 capsules; write, one at 2, 4, 6, 8, and 10 P.M.

It will be noticed that these capsules contain $\frac{1}{20}$ grain of strychnine each, and that 1 is to be given every

two hours until 5 such doses are given, making ¼ grain of strychnine in eight hours. These would be excessive doses for one not under the influence of an opiate, but it must be remembered that morphine opposes strychnine in most all of its range of action, and that it is necessary to overcome its paralyzing action on the motor function of the bowel.

Unless a quantity sufficient to do this is given, the secretory stimulants given with it will simply stir up a storm in the upper parts of the intestinal canal, accompanied by nausea, vomiting, other distress, but no bowel action will occur. It is more than likely that this storm would have to be allayed by an increased dose of the opium.

During the time these purgative capsules are being given, the patient should have his usual dose of morphine, but none must be given from the time of giving his last purgative capsule until free evacuations have been obtained. The physician should take charge of the patient's drug supply at the time of beginning the purgative course and control it from that time on. If left to himself he will take a dose at an inopportune time and thus delay or prevent the action of the purgative.

The strychnine and atropine in these capsules will excite a fair degree of peristalsis notwithstanding the restraining effects of the opium, and this will usually enable the secretory stimulants given with them to induce free evacuation from the bowel in eight or ten hours from the time of giving the last purgative capsule, thus securing bowel movements before the time for the next dose of opiate.

But more certainly to accomplish this result, six hours from the time of giving the last purgative capsule, give $\frac{1}{20}$ grain of strychnine hypodermically and follow

in half an hour with 2 ounces of castor oil or full dose of salts, and repeat both the strychnine and the oil or salts at intervals of two hours until the intestinal canal is thoroughly empty.

If the bowels begin to act before the time of the usual morning dose of the morphine, the patient will experience little, if any, discomfort; but if not, the opiate must be withheld until the bowel has been emptied. This may be a stormy period, but the storm must be weathered.

If the ingredients of the purgative course and the strychnine have been properly adjusted to the case in hand, the bowel will begin to act in six or eight hours from the time of giving the last purgative capsule and a number of free evacuations will have been obtained before the time for giving the morning dose of morphine. The relief afforded by this active elimination is usually such as to enable the patient to go in comfort several hours beyond the time for his morning dose of opium, and if he can he should do this, thus allowing more time for elimination.

When the patient has gone without his dose of opium as long as he can without discomfort, give it to him, but in reduced quantity. It will be found that, after the bowel has been thoroughly emptied and the patient has gone without the opiate several hours beyond the usual time for his dose, not more than half the quantity of morphine which he had been taking will be required to meet the demands of the system. This quantity should be given at regular intervals, observing the hours at which he had been accustomed to taking his dose.

Forty-eight hours from the time the first purgative course was begun another should be started and given as the first. This course may be less or more active

according to the effects obtained from the first one. It should be followed by strychnine and salts or oil, as in the first instance.

This course carries into and out of the intestinal canal a residue of extremely toxic matter and the relief obtained from it is even more marked than from the first. After its action a smaller quantity of morphine will meet the demand of the system than after the first course, but whatever quantity may be found necessary to keep the patient free from abstinence symptoms should be given, and this should be continued at regular intervals throughout the remainder of the acute ailment.

Following the second purgative course, the bowel should be kept active by the regular and persistent administration both of a motor and secretory stimulant, and thus a recurrence of intestinal toxemia be prevented. From $\frac{1}{40}$ to $\frac{1}{20}$ grain of podophyllin or 20 grains of sodium hyposulphite given at intervals of from two to four hours during the remainder of the acute ailment will usually answer the purpose admirably, but these only meet the demand for a secretory stimulant.

To insure the activity of the other function which is essential to bowel movement, a sufficient quantity of strychnine should be given during the evening hours of each day to excite active peristalsis.

With elimination thus efficiently secured by stimulation of both the motor and secretory functions of the bowel and with the same kept active during the remainder of the acute ailment, that ailment, whatever it is, can be treated with but little more difficulty and with about as much success as if there were no drug addiction present.

It is a great mistake to attempt to reduce the quantity of drug a patient of this class is taking during an acute ailment, except as above noted.

Any attempt at gradual reduction of the dose will only aggravate the symptoms of the acute ailment, increase the fever, make the patient more restless, and cause him to suffer unnecessarily, and without benefit.

The quantity of the drug taken does not make much difference, but it is material that the system shall be kept free from toxic matter. If the bowels are allowed to become clogged, the reabsorption of intestinal contents occurs and this will aggravate all the symptoms of any ailment, and especially of any inflammatory ailment, with which the patient may be suffering.

It is unwise to depend upon the action of secretory stimulants alone to keep up bowel action. The motor function of the bowel is just as essential to bowel movement as the secretory function of the glands, and this should be efficiently provided for by direct stimulation of the motor centers.

The effects of the opiate in paralyzing the motor function of the bowel is so marked and so persistent that reflex action alone cannot be depended upon to provide this essential function to bowel movement.

Again, if all the functions concerned in the evacuation of waste *be stimulated proportionately and at the proper time,* bowel evacuation can be induced without exhausting the patient; but if we stimulate the secretory functions of the bowel excessively and depend upon its reflex influence to excite the other essential function, we shall have created such great activity of the excretory glands as to be exhausting when action does occur, and this would materially weaken the patient.

But if all the functions be stimulated proportionately, evacuation of the bowel can be secured without weakening the patient. In fact, he will be better off while having his bowel regularly moved.

If the bowel is much constipated it will be well to empty the lower bowel with an enema before beginning the purgative course, as this will give the patient some relief and leave less for the purgative to do.

But it must be remembered that merely flushing the colon does not empty the intestinal canal, nor so cleanse the system as to prevent reabsorption of intestinal contents. If the system is *kept free from toxins of intestinal and auto- origin the acute ailment will run practically a normal course notwithstanding the fact that the patient uses a narcotic drug.*

CHAPTER XVIII.

REVIEW OF LITERATURE.

DE QUINCY.

In the chapter on the history of narcotic addiction the author expressed the opinion that the writings of De Quincy, during the early part of the nineteenth century, did much to call attention to and to popularize the use of opium.

The following extracts from his writings on the "Pleasures of Opium," taken from his "Confessions of an English Opium Eater," are considered of sufficient interest to justify their reproduction in this connection:—

"But, as I do not readily believe that any man, having once tasted the divine luxuries of opium, will afterward descend to the gross and mortal enjoyment of alcohol, I take it for granted

> "'That those eat now who never ate before;
> And those who always ate, now eat the more.'

"Indeed, the fascinating powers of opium are admitted even by those medical writers who are its greatest enemies: thus, for instance, Awsiter, apothecary to Greenwich Hospital, in his 'Essay on the Effects of Opium' (published in the year 1763), when attempting to explain why Mead had not been sufficiently explicit on the properties, counteragents, etc., of this drug, expresses himself in the following mysterious terms (perfectly intelligible, however, to those who are in the secret): 'Perhaps he thought the subject of too delicate a nature to be made common; and as many people might then indiscriminately use it, it would take from that necessary fear and caution which should

prevent their experiencing the extensive power of this drug, *for there are many properties in it, if universally known, that would habituate the use, and make it more in request with us than the Turks themselves,* the result of which knowledge,' he adds, 'must prove a general misfortune.' In the necessity of this conclusion I do not at all concur; but upon that point I shall have occasion to speak more freely in the body of the work itself. And at this point I shall say no more than that opium, as the one sole *catholic* anodyne which hitherto has been revealed to man; secondly, as the one sole anodyne which in a vast majority of cases is *irresistible;* thirdly, as by many degrees the most potent of all known counteragents to nervous irritation, and to the formidable curse of *tædium vitæ;* fourthly, as by possibility, under an argument undeniably plausible, alleged by myself, the sole known agent—not for curing *when* formed, but for intercepting whilst likely to be formed—the great English scourge of pulmonary consumption—I say that opium, as wearing these, or *any* of these, four beneficent characteristics—I say that any agent whatever making good such pretensions, no matter what its name—is entitled haughtily to refuse the ordinary classification and treatment which opium receives in books. I say that opium, or any agent of equal power, is entitled to assume that it was revealed to man for some higher object than that it should furnish a target for moral denunciations, ignorant where they are not hypocritical, childish where not dishonest; that it should be set up as a theatrical scarecrow for superstitious terrors, of which the *result* is oftentimes to defraud human suffering of its readiest alleviations. . . .

"Amongst the most potent of anodynes, we may rank hemlock, henbane, chloroform, and opium. But unquestionably the three first have a most narrow field of action, by comparison with opium. This, beyond all other agents made known to man, is the mightiest for its command, and for the extent of its command, over pain; and so much mightier than any other, that I should

think, in a Pagan land, supposing it to have been adequately made known through experimental acquaintance with its revolutionary magic, opium would have had altars and priests concentrated to its benign and tutelary powers. But this is not my own object in the present little work. Very many people have thoroughly misconstrued this object; and therefore I beg to say here, in closing my original preface, a little remodelled, that what I contemplated in these Confessions was to emblazon the power of opium—not over bodily disease and pain, but over the grander and more shadowy world of dreams. . . .

"I have often been asked—how it was, and through what series of steps, that I became an opium-eater. . . . Simply as an anodyne it was, under the mere coercion of pain the severest, that I first resorted to opium; and precisely that same torment it is, or some variety of that torment, which drives most people to make acquaintance with that same insidious remedy. Such was the fact; such by accident. Meantime, without blame it might have been otherwise. If in early days I had fully understood the subtle powers lodged in this mighty drug (when judiciously regulated), (1) to tranquillise all irritations of the nervous system; (2) to stimulate the capacities of enjoyment; and (3) under any call for extraordinary exertion (such as all men meet at times), to sustain through twenty-four consecutive hours the else-drooping animal energies—most certainly, knowing or suspecting all this, I should have inaugurated my opium career in the character of one seeking *extra* power and enjoyment, rather than of one shrinking from *extra* torment. And why not? If *that* argued any fault, is it not a fault that most of us commit every day with regard to alcohol? Are we entitled to use *that* only as a medicine? Is wine unlawful, except as an anodyne? I hope not; else I shall be obliged to counterfeit and to plead some anomalous *tic* in my little finger; and thus gradually, as in any Ovidian metamorphosis, I, that am at present a truth-loving man, shall change by daily inches into a dissembler. No: the

whole race of man proclaim it lawful to drink wine without pleading a medical certificate as a qualification. That same license extends itself therefore to the use of opium; what a man may lawfully seek in wine surely he may lawfully find in opium; and much more so in those cases (of which mine happens to be one) where opium deranges the animal economy less by a great deal than an equivalent quantity of alcohol. Coleridge, therefore, was doubly in error when he allowed himself to aim most unfriendly blows at my supposed voluptuousness in the use of opium; in error as to a principle, and in error as to a fact. . . . Coleridge's bodily affliction was simple rheumatism. Mine, which intermittingly raged for ten years, was rheumatism in the face combined with toothache. This I had inherited from my father; or inherited (I should rather say) from my own desperate ignorance; since a trifling dose of colocynth, or of any similar medicine, taken three times a week, would more certainly than opium have delivered me from that terrific curse. In this ignorance, however, which misled me into making war upon toothache when ripened and manifesting itself in effects of pain, rather than upon its germs and gathering causes, I did but follow the rest of the world. To intercept the evil whilst yet in elementary stages of formation, was the true policy; whereas I in my blindness sought only for some mitigation to the evil when already formed, and past all reach of interception. In this stage of the suffering, formed and perfect, I was thrown passively upon chance advice, and therefore, by a natural consequence, upon opium—that being the one sole anodyne that is almost notoriously such, and which in that great function is universally appreciated. . . .

"Any attentive reader, after a few moments' reflection, will perceive that, whatever may have been the casual *occasion* of mine or Coleridge's opium-eating, this could not have been the permanent *ground* of opium-eating; because neither rheumatism nor toothache is any *abiding* affection of the system. Both are intermitting maladies, and not at all capable of accounting for a

permanent habit of opium-eating. Some months are requisite to found *that*. Making allowance for constitutional differences, I should say that *in less than 120 days* no habit of opium-eating could be formed strong enough to call for any extraordinary self-conquest in renouncing it, and even suddenly renouncing it. . . . Rheumatism, he says, drove him to opium. Very well, but with proper medical treatment the rheumatism would soon have ceased; or even, without medical treatment, under the ordinary oscillations of natural causes. And when the pain ceased, then the opium should have ceased. Why did it not? Because Coleridge had come to taste the genial pleasure of opium, and thus the very impeachment, which he fancied himself in some mysterious way to have evaded, recoils upon him in undiminished force. The rheumatic attack would have retired before the habit could have had time to form itself. Or suppose that I underrate the strength of the possible habit—this tells equally in *my* favour; and Coleridge was not entitled to forget in *my* case a plea remembered in his own. It is really memorable in the annals of human self-deceptions, that Coleridge could have held such language in the face of such facts. I, boasting not at all of my self-conquests, and owning no moral argument against the free use of opium, nevertheless on mere *prudential* motives break through the vassalage more than once, and by efforts which I have recorded as modes of transcendent suffering. Coleridge, professing to believe (without reason assigned) that opium-eating is criminal, and in some mysterious sense more criminal than wine-drinking or porter-drinking, having, therefore, the strongest *moral* motive for abstaining from it, yet suffers himself to fall into a captivity to this same wicked opium, deadlier than was ever heard of, and under no coercion whatever that he has anywhere explained to us. . . .

"But to quit this episode, and to return to my intercalary year of happiness. I have said already that, on a subject so important to us all as happiness, we should listen with pleasure to any man's

experience or experiments, even though he were but a ploughboy, who cannot be supposed to have ploughed very deep in such an intractable soil as that of human pains and pleasures, or to have conducted his researches upon any very enlightened principles. But, I, who have taken happiness, both in a solid and a liquid shape, both boiled and unboiled, both East Indian and Turkish—who have conducted my experiments upon this interesting subject with a sort of galvanic battery, and have, for the general benefit of the world, inoculated myself, as it were, with the poison of eight thousand drops of laudanum per day (and for the same reason as a French surgeon inoculated himself lately with a cancer, an English one, twenty years ago, with plague, and a third, who was also English, with hydrophobia), I, it will be admitted, must surely now know what happiness is, if anybody does. And therefore I will here lay down an analysis of happiness; and, as the most interesting mode of communicating it, I will give it, not didactically, but wrapped up and involved in a picture of one evening, as I spent every evening during the intercalary year, when laudanum, though taken daily, was to me no more than the elixir of pleasure."

A number of articles descriptive of the pleasures of opium appeared in the *London Magazine,* beginning as early as the year 1821, and these continued to appear from time to time for a number of years. These articles attracted much attention. An editorial note called special attention to the first of these, and upon the appearance of the second this was repeated with emphasis, with a special tribute to "the deep, eloquent, and masterly paper which stands first in our present number."

It can readily be seen that such articles appearing in the leading magazines of the times would lead many to experiment with a drug possessing the wonderful

powers attributed by the writer to this one. These experiments led many to hopeless slavery before the later writings of De Quincy appeared to give them warning of their danger. It was not until a number of years later that he realized the abject slavery growing out of the habitual use of opium and then his writings changed in their character and from that time on he wrote on the "Pains of Opium," but his writings on the "Pains" were not so popular and did not attract anything like the attention that the writings on the "Pleasures" had done, and the later writings were not able to "catch up" with the earlier writings or to anything like offset the damage done by them. He used opium for over fifty years, in the form of gum opium at first and later in the form of laudanum.

The following extracts are examples of his later writings:—

"The fact is, I imagine myself writing at a distance of twenty —thirty—fifty years ahead of this present moment, either for the satisfaction of the few who may then retain any interest in myself, or of the many (a number that is sure to be continually growing) who will take an inextinguishable interest in the mysterious powers of opium. For opium *is* mysterious; mysterious to the extent, at times, of apparent self-contradiction; and *so* mysterious, that my own long experience in its use—sometimes even in its abuse—did but mislead me into conclusions ever more and more remote from what I now suppose to be the truth. Fifty-and-two years' experience of opium, as a magical resource under *all* modes of bodily suffering, I may now claim to have had—allowing only for some periods of four and six months, during which, by unexampled efforts of self-conquest, I had accomplished a determined abstinence from opium. These parentheses being subtracted, as also, and secondly, some off-and-on fits of tentative and intermitting dalliance with opium in the

opening of my career—these deductions allowed for, I may describe myself as experimentally acquainted with opium for something more than half-a-century. What, then, is my final report upon its good and evil results? . . .

"But now farewell, a long farewell, to happiness, winter or summer! farewell to smiles and laughter! farewell to peace of mind, to tranquil dreams, and to the blessed consolations of sleep! For more than three years and a half I am summoned away from these. Here opens upon me an Iliad of woes; for I now enter upon *the pains of opium.*"

Copy from De Quincy's Confessions,
Pages 106 to 109.

"THE PAINS OF OPIUM.

"At length a friend in Edinburgh sent me down Mr. Ricardo's book; and, recurring to my own prophetic anticipation of the advent of some legislator for this science, I said, before I had finished the first chapter, 'Thou art the man.' Wonder and curiosity were emotions that had long been dead in me. Yet I wondered once more: I wondered at myself that I could once again be stimulated to the effort of reading; and much more I wondered at the book. Had this profound work been really written in England during the nineteenth century? Was it possible? I supposed thinking had been extinct in England. Could it be that an Englishman, and he not in academic bowers, but oppressed by mercantile and senatorial cares, had accomplished what all the universities of Europe, and a century of thought, had failed even to advance by one hair's breath? All other writers had been crushed and overlaid by the enormous weight of facts and documents; Mr. Ricardo had deduced, *a priori,* from the understanding itself, laws which first gave a ray of light into unwieldy chaos of materials, and had constructed what had been but a collection of tentative discussions into a science of regular proportions, now first standing on an eternal basis.

"Thus did one simple work of profound understanding avail to give me a pleasure and an activity which I had not known for years: it roused me even to write, or, at least, to dictate what M. wrote for me. It seemed to me that some important truths had escaped even 'the inevitable eye' of Mr. Ricardo; and, as these were, for the most part, of such a nature that I could express or illustrate them more briefly and elegantly by algebraic symbols than in the usual clumsy and loitering diction of economists, the whole would not have filled a pocket-book; and being so brief, with M. for my amanuensis, even at this time, incapable as I was of all general exertion, I drew up my prolegomena to all future systems of political economy. I hope it will not be found redolent of opium, though indeed, to most people, the subject itself is a sufficient opiate.

"This exertion, however, was but a temporary flash, as the sequel showed, for I designed to publish my work. Arrangements were made at a provincial press, about eighteen miles distant, for printing it. An additional compositor was retained for some days on this account. The work was even twice advertised; and I was, in a manner, pledged to the fulfillment of my intention. But I had a preface to write; and a dedication, which I wished to make a splendid one to Mr. Ricardo. I found myself quite unable to accomplish all this. The arrangements were countermanded, the compositor dismissed, and my 'prolegomena' rested peacefully by the side of its elder and more dignified brother.

"I have thus described and illustrated my intellectual torpor, in terms that apply, more or less, to every part of the four years during which I was under the Circean spells of opium. But for misery and suffering, I might, indeed, be said to have existed in a dormant state. I seldom could prevail on myself to write a letter; an answer of a few words, to any that I received, was the utmost that I could accomplish, and often that not until the letter had lain weeks, or even months, on my writing-table. Without

the aid of M., all records of bills paid, or to be paid, must have perished; and my whole domestic economy, whatever became of political economy, must have gone into irretrievable confusion. I shall not afterward allude to this part of the case; it is one, however, which the opium-eater will find, in the end, as oppressive and tormenting as any other, from the sense of incapacity and feebleness, from the direct embarrassment incident to the neglect or procrastination of each day's appropriate duties, and from the remorse which must often exasperate the stings of these evils to a reflective and conscientious mind. The opium-eater loses none of his moral sensibilities or aspirations; he wishes and longs as earnestly as ever to realize what he believes possible, and feels to be exacted by duty; but his intellectual apprehension of what is possible infinitely outruns his power, not of execution only, but of even power to attempt. He lies under the weight of incubus and nightmare; he lies in sight of all that he would fain perform, just as a man forcibly confined to his bed by the mortal languor of a relaxing disease, who is compelled to witness injury or outrage offered to some object of his tenderest love; he curses the spells which chain him down from motion, he would lay down his life if he might get up and walk, but he is powerless as an infant, and cannot even attempt to rise. . . .

"However, as some people, in spite of all laws to the contrary, will persist in asking what became of the opium-eater, and in what state he now is, I answer for him thus: The reader is aware that opium had long ceased to found its empire on spells of pleasure; it was solely by the tortures connected with the attempt to abjure it, that it kept its hold. Yet, as other tortures, no less, it may be thought, attended the non-abjuration of such a tyrant, a choice only of evils was left; and that might as well have been adopted, which, however terrific in itself, held out a prospect of final restoration to happiness. This appears true; but good logic gave the author no strength to act upon it. However, a crisis arrived for the author's life, and a crisis for other objects still

dearer to him, and which will always be far dearer to him than life, even now that it is again a happy one. I saw that I must die, if I continued the opium: I determined, therefore, if that should be required, to die in throwing it off. How much I was at that time taking, I cannot say; for the opium which I used had been purchased for me by a friend, who afterward refused to let me pay him; so that I could not ascertain even what quantity I had used within a year. I apprehend, however, that I took it very irregularly, and that I varied from about 50 or 60 grains to 150 a day. My first task was to reduce it to 40, to 30, and, as fast as I could, to 12 grains.

"I triumphed; but think not, reader, that therefore my sufferings were ended; nor think of me as of one sitting in a dejected state. Think of me as of one, even when four months had passed, still agitated, writhing, throbbing, palpitating, shattered; and much, perhaps, in the situation of him who has been racked, as I collect the torments of that state from the affecting account of them left by the most innocent sufferer (of the time of James I). Meantime, I derived no benefit from any medicine, except one prescribed to me by an Edinburgh surgeon of great eminence, namely, ammoniated tincture of valerian. Medical account, therefore, of my emancipation, I have not much to give; and even that little, as managed by a man so ignorant of medicine as myself, would be misplaced in this situation. The moral of the narrative is addressed to the opium-eater; and therefore, of necessity, limited in its application. If he is taught to fear and tremble, enough has been effected. But he may say, that the issue of my case is at least a proof that opium, after a seventeen years' use, and an eight years' abuse of its powers may still be renounced; and that he may chance to bring to the task greater energy than I did, or that with a stronger constitution than mine, he may obtain the same results with less. This may be true; I would not presume to measure other men by my own. I heartily wish him more energy, I wish him the same success. Nevertheless, I had

motives external to myself which he may unfortunately want; and these supplied me with conscientious support, which mere personal interest might fail to supply to a mind debilitated by opium.

"Jeremy Taylor conjectures that it may be as painful to be born as to die. I think it probable; and, during the whole period of diminishing the opium, I had the torments of a man passing out of one mode of existence into another. The issue was not death, but a sort of physical regeneration, and, I may add, that ever since, at intervals, I have had a restoration of more than youthful spirits, though under the pressure of difficulties, which, in a less happy state of mind, I should have called misfortunes. . . .

"Opium, therefore, I resolved wholly to abjure, as soon as I should find myself at liberty to bend my undivided attention and energy to this purpose. It was not, however, until the 24th of June last that any tolerable concurrence of facilities for such an attempt arrived. On that day I began my experiment, having previously settled in my own mind that I would not flinch, but would 'stand up to the scratch,' under any possible 'punishment.' I must premise, that about 170 or 180 drops had been my ordinary allowance for many months. Occasionally I had run up as high as 500, and once nearly to 700. In repeated preludes to my final experiment I had also gone as low as 100 drops, but had found it impossible to stand it beyond the fourth day, which, by the way, I have always found more difficult to get over than any of the preceding three. I went off under easy sail—130 drops a day for three days; on the fourth I plunged at once to 80. The misery which I now suffered 'took the conceit' out of me at once; and for about a month I continued off and on about this mark; then I sunk to 60, and the next day to—none at all. This is the first day for nearly ten years that I had existed without opium. I persevered in my abstinence for ninety hours; that is, upwards of half a week. Then I took—ask me not how much; say, ye

severest, what would ye have done? Then I abstained again; then took about twenty-five drops; then abstained; and so on.

"Meantime, the symptoms which attended my case for the first six weeks of the experiment were these: enormous irritability and excitement of the whole system; the stomach, in particular, restored to a full feeling of vitality and sensibility, but often in great pain; unceasing restlessness night and day; sleep—I scarcely knew what it was—three hours out of the twenty-four was the utmost I had, and that so agitated and shallow that I heard every sound that was near me; lower jaw constantly swelling; mouth ulcerated; and many other distressing symptoms that would be tedious to repeat, amongst which, however, I must mention one, because it had never failed to accompany any attempt to renounce opium,—namely, violent sternutation (sneezing). This now became exceedingly troublesome; sometimes lasting for two hours at once, and recurring at least twice or three times a day. I was not much surprised at this, on recollecting what I had somewhere heard or read, that the membrane which lines the nostrils is a prolongation of that which lines the stomach; whence, I believe, are explained the inflammatory appearances about the nostrils of the dram-drinker. The sudden restoration of its original sensibility to the stomach expressed itself, I suppose, in this way. It is remarkable, also, that, during the whole period of years through which I had taken opium, I had never once caught cold (as the phrase is), nor even had the slightest cough. But now a violent cold attacked me, and a cough soon after. In an unfinished fragment of a letter begun about this time to —— I find these words: 'You ask me to write the . . . Do you know Beaumont and Fletcher's play of Thuerry and Theodoret?' There you will see my case as to sleep; nor is it much of an exaggeration in other features. I protest to you that I have a greater influx of thoughts in one hour at present than in a whole year under the reign of opium. It seems as though all the thoughts which had been frozen up for

a decade of years by opium had now, according to the old fable, been thawed at once, such a multitude stream in upon me from all quarters. Yet such is my impatience and hideous irritability, that, for one which I detain and write down, fifty escape me. In spite of my weariness from suffering and want of sleep, I cannot stand still or sit for two minutes together.

"'I munc, et versus tecum meditare canorus.'

"By the advice of the surgeon, I tried bitters. For a short time these greatly mitigated the feelings under which I labored; but about the forty-second day of the experiment the symptoms already noticed began to retire, and new ones to arise of a different and far more tormenting class. Under these, with but a few intervals of remission, I have since continued to suffer."

AUTHOR'S COMMENT.

The author wishes to emphasize the last paragraph in the foregoing extract from De Quincy's writings. A resort to alcoholic drinks of any kind is one of the most dangerous things an ex-habitué can do. The demand for the effects of alcohol grows upon such a person so rapidly that self-control is very quickly lost and then every step forward is more distressing. There is no escape, so far as the victim's own efforts go, except through a return to the opiate and that is like "jumping out of the frying pan into the fire."

It is suggested to physicians and others who are so ready with advice to drug users to quit taking their drug, "just to quit," that a careful study of De Quincy's experience in "quitting" might give them different ideas from those now held as to the ease with which "quitting" can be done. His persistent, heroic efforts for freedom were almost superhuman and yet they were not rewarded with success. It would seem hardly worth while for

others to undertake to do in this line what a methodical, stoical Englishman could not do, and yet the advice "just quit it" is ready on every hand.

Quitting opium by sheer force of will is a thing to be dreamed of, but hardly to be accomplished.

CHAPTER XIX.

REVIEW OF LITERATURE (CONTINUED).

ERLENMEYER.

"THE treatment of the morphine habit is threefold; First, the use of the poison must be discontinued; second, the physical and mental disturbances arising during the period of the withdrawal must be combated; and third, after the patient is cured, means must be taken to prevent a return to the habit.

"Before taking up these points seriatim, a few words about the general principles of treatment seem necessary.

"During the entire period of abstinence, the craving for morphine enters as a very important element, and in consequence of this craving, the patient is frequently utterly uncontrollable. Then, when the habit is partially overcome, the danger of a relapse is always to be borne in mind and provided against. . . .

"*Methods of Withdrawal.*—There are three methods of withdrawal:—

"1. The gradual mode.

"2. The sudden mode.

"3. The rapid mode.

"1. THE GRADUAL MODE.

"This is the oldest of the various methods of discontinuance; the first in vogue, and till recently, practised by almost all physicians in the treatment of morphiomania. I myself formerly depended on this method, but being convinced of its unsatisfactory character, some years ago I abandoned it for what has proved to be a more rational system. The nature of this mode of treatment is indicated by its name. It is the 'tapering-off' method of the English. The daily dose of morphine is decreased by a very

small fraction, then the drug is finally left off altogether. The amount of decrease each day is made dependent on the appearance or absence of certain symptoms known as *phenomena of abstinence.* The more pronounced these symptoms and the greater their severity, the smaller must be the reduction of the opiate. . . .

"A second equally great disadvantage of this method is the prolongation of the morbid phenomena which characterize the abstinence period; the patient is kept in misery, and loses strength and flesh.

"I cannot agree with those who affirm that the patient can better endure the abstinence symptoms under the slow than under the sudden method. The symptoms might be less severe for a single day, but surely the sum of discomfort will be greater during the slow process of leaving off than during the quicker processes. A gradual treatment drags along three or four or even more weeks; the patient cannot recuperate, and convalescence is very tedious. The affirmation which has been made against the quick and in favor of the gradual process—that the organism can better endure lesser and more prolonged perturbations and strains than stronger and more rapid—contradicts experience in all departments of pathology. I must call your attention to the fact that the patient during the carrying out of the gradual method of treatment is not spared a single symptom peculiar to the sudden method excepting perhaps the collapse, for what he gains in the lesser intensity of the symptoms, he loses in the longer duration. . . .

"No benefits are derived by the patient from this method; the only benefits are realized by the physician and his institute.

"Therefore I do not hesitate to declare that this slow method is wholly unreliable and unsatisfactory. I have had ten years' experience with it in our institution, only to be more and more convinced of its worthlessness. . . .

"2. The Sudden Method of Withdrawal.

"Levinstein was the first exponent and defender of this method, which is now called the Levinstein method.

"The principle of this method consists in the patient being at once wholly deprived of the use of morphine. When he enters the institute, his supply is stopped, and he is kept under constant surveillance so that he can obtain no more. He is generally put to bed, and kept there a while. . . .

"The *delirium maniacale,* one of the first symptoms of the sudden withdrawal, which is always connected with certain dangers to the attendant, cannot, of course, be treated in every place, and by everybody. In order that this period of high excitement may pass safely, certain precautions and means for security of persons and property are necessary. Above all, it is important that the part of the hospital where the patient is treated shall be separated from all other apartments and wards. Not only must the patient be isolated in order to prevent any possible obtention of drugs, but the other patients must not be disturbed by the maniacal cries and noise of the morphine victim. The room in which the latter is undergoing treatment must contain no movable furniture, or any utensils that can be broken. A strong bedstead, a night-chair, and a common chair or lounge are all that is required. All kinds of smaller furniture and vessels are strictly to be removed out of the way, as they may become dangerous weapons in the hands of the excited patient; especially must knives, scissors, etc., be kept away. The doors are to be securely locked, and the windows are to be so arranged that no danger whatever can be feared. Heating and lighting arrangements require great care. It is recommended to have an adjacent room free, for meals or entertainment of company, where the patient may spend quiet hours, and where also may be kept on hand the necessary remedies for certain symptoms as they may arise: wine and brandy, and ether; also ice-water, etc. Cooking appli-

ances should also be conveniently at hand, and a bathroom should be readily accessible.

"The assistants and servants must be persons on whom for conscientiousness and fidelity you can rely; the subordinate medical attendants and the nurses must not be susceptible to persuasion or to bribery, so that all possibility of obtention of morphine shall be out of the question. The physician-in-chief or his subordinates must be with the patient night and day during the first few days of the treatment, when the struggle is greatest; there will be a collapse of the vital forces, and it may be a matter of life or death for the patient, and in this hour of danger, ripe experience, presence of mind, and readiness in emergencies are necessary in physicians and attendants. They must pitilessly resist the importunities of the patient for morphine, while, at the same time, they must not lose their compassion and sympathy for the poor sufferer. There will be numerous symptoms constantly occurring, such as vomiting, diarrhea, restlessness, which will demand attention and will keep the medical attendant and nurses busy; there will for a time, in fact, be no rest for anybody. The responsibility of keeping the patient from inflicting injury on himself is no light strain on the nerves of the physician, who must exercise untiring vigilance, and no one can endure this strain more than twelve hours without respite and rest. In fact, the severity of the task renders frequent change with fresh attendants necessary, and an institution which attempts to carry out this method of cure is obliged to keep on hand a large cortege of assistants and nurses. . . .

"3. The Rapid Method of Withdrawal.

"A modified method of discontinuance had already been employed by Levinstein, though only in severe cases of disease or weakness where it would be dangerous to apply the sudden method, as in phthisis, emphysema, heart disease, etc., and in the case of very sensitive persons, especially women.

"In my endeavors to find and develop a method which would be only of benefit and could never be an injury or disadvantage to the patient, I began with this modified system; I have further improved upon it, and now rely upon it almost exclusively. Formerly I called it the *modified slow method;* I now call it the rapid mode.

"My method has really nothing in common with Levinstein's *modified mode of withdrawal.* By the latter process, the patient without regard to the doses which he had previously been taking, is at once, for the first two or three days of his treatment, put on the short allowance of 5 centigrammes (about a grain) of morphine. This virtually amounts to the sudden method of withdrawal of which I have before spoken, and takes no account of accustomed doses, the duration of the habit, and the condition of the patient; it is, in fact, applied to every case whose treatment seems to require modification in consideration of the circumstances above mentioned.

"The nature of the method which I now advocate consists in as rapidly as possible removing the morphine, though not suddenly, the aim being to avoid any danger of death. My experience has taught me that from six to twelve days are sufficient to accomplish the weaning, although the time required for a cure depends largely upon the quantity of morphine which the patient has been in the habit of taking, the duration of his bondage to the habit, and the number and kinds of 'cures' which he has already passed through, which make each following treatment more difficult; lastly, on the age and physical constitution of the patient. During the first two to six days, I endeavor to withdraw altogether habitual doses of from 30 to 60 centigrammes (5 to 8 grains), and find that ten days are sufficient, without collapse ensuing, or disturbances in the breathing or pulse, for the withdrawal of daily doses amounting to 1.5 to 2 grammes of morphine. . . .

Symptom-treatment Directed to the Consequences of Abstinence.

"The symptoms occurring during the treatment are the consequences of the discontinuance of a powerful drug to which the organism has become accustomed. They constitute the reaction, which occurs to a greater or less extent no matter what method of leaving off is employed. The disappearance of these symptoms is only a question of time, but while they last, what can be done must be done to mitigate their severity. We will consider in their order the various phenomena rendering a symptomatic therapy necessary.

"The Collapse.

"This is the most dangerous of all symptoms resulting from the withdrawal. It demands a prompt and energetic treatment from the danger to life which attends it. It must not be forgotten that a case of collapse apparently very light may become severe and even fatal; therefore, this symptom must be early and effectively met. Fortunately, there is always at hand a sovereign remedy which, taken at the proper time, will obviate all the danger of the collapse; I refer to morphine.

"As soon as the first symptoms: irregularity of the pulse and respiration, pallor and lividity of the skin and mucous membranes, feelings of faintness, make their appearance, an injection of 0.025 (⅓ grain) of morphine is made. If after ten or twelve minutes the symptoms do not subside, or if others should develop, the same injection is repeated, and this may be done three or four times in succession. Other means, such as ether injections, are uncertain and unreliable. I repeat, you must not hesitate to resort to the morphine injections on the least appearance of collapse. There is, moreover, a series of analeptic medicines to be employed as adjuvants, viz., hot tea or coffee, alcoholic stimulants, as Cognac, port wine, or champagne, besides cutaneous irritation, hot-water applications over the abdomen, etc.

"In case the respiration should stop, faradization of the phrenic nerves should be attempted. When the danger has passed, the pulse and respiration are still to be watched for some time, especially during the sleep which usually follows the collapse. The severer symptoms, however, do not all make their appearance if the morphine is injected early.

"DELIRIUM.

"The milder forms of delirium that appear during the slow method of withdrawal generally pass off with the use of alcoholic stimulants. For the maniacal delirium, however, two or three morphine injections may be required, especially when the excitement assumes a dangerous aspect. Apart from this, the therapeutics of delirium tremens, such as large doses of chloral, paraldehyde, or opium, are also here applicable. . . .

"DIARRHEA AND COLIC.

"The first of these symptoms occurs in the case of nearly every patient. It makes its appearance toward the end of the withdrawal period, or one or two days after the last injection. It is to be regarded as rather salutary than injurious, and if it should not come on in due time a purgative is given to clear the *primæ viæ*. Where the diarrhea is absent, the patient's restlessness is greater. Therefore I take no pains on the first and second day of the diarrhea to stop it, unless it becomes excessive or causes painful sensations in the anus, or great tenesmus. The treatment is both dietetic and medicinal. For diet we give barley and flour gruel, rice and rice water, sago, toast, mutton tea, red wine, etc. Opium, of course, stands first among the medicines. . . .

"There are notably, during the treatment of morphinism, phases of depression and prostration, periods when the patient cannot rise from his armchair or his bed all day long; when he feels as if there were no life in his arms and legs, and when the

moral gloom or discouragement intensifies and complicates the physical oppression. It is then that alcohol and all the stimulants of the nervous system are useful."

AUTHOR'S COMMENT.

The foregoing extract from Erlenmeyer fairly represents the great mass of literature which has appeared on this subject from the earliest mention of it to within the last decade. None of the writers seemed to have any conception of the pathology of the condition and none advised any treatment other than the withdrawal of the drug and the treatment of symptoms as they arose.

No effort was made to remove the cause of these complications and to thereby thwart their development. In fact, the entire phenomena following the withdrawal of the drug were looked upon as an entity and considered unavoidable.

Even in the symptomatic treatment which they advised, alcohol in some form was one of the remedies almost always recommended, and this was extremely hurtful rather than helpful.

All of the European writers, with one worthy exception, classed narcotic addiction as a vice, a mere habit, and American writers contented themselves with a parrot-like repetition of their views.

At the time the author took up the study of this subject, not an original idea, not a helpful suggestion as to either the pathology or treatment of drug addiction, had been introduced into the literature of the subject, except those advanced by Jennings, during the preceding quarter of a century.

The question of pathology was either dismissed with the statement that the "pathology is nil," or the manifestations accompanying and following the withdrawal

of the drug were attributed to some obscure nerve lesion which was supposed to exist, but which could not be demonstrated. The entire subject was shrouded in mystery and addiction to a narcotic drug was looked upon as an untreatable entity.

In the matter of treatment, practically all writers recommended the patient be "weaned" from his drug, and this was undertaken in one of three ways, that is, by gradually or rapidly reducing the daily allowance or by at once discontinuing it. Numerous remedies were suggested for the relief of the complications which attended or followed this "weaning." The success of these measures of treatment are best shown by the statement of one who depended upon them for relief during this "weaning" process.

It is barely possible that, when nothing that gave greater assistance was available, it was better to undergo such an ordeal of suffering as is involved in this "weaning" process rather than to continue in drug slavery, but most patients who submitted even to this barbarous method suffered to no advantage, because the numerous complications which followed the "weaning" were such as to force a return to the use of the opiate.

The following example of the progress and results of this "weaning" process is taken from the 1909 American edition of Jennings's work, pages 447-455. It speaks for itself as to the mercifulness and efficiency of some of the methods of treatment which have been and are still advised by a majority of writers:—

"EXPERIENCES IN DIFFERENT EUROPEAN SANATORIUMS.

"The following extracts are from La Lutte, by Leon Daudet, and give a graphic account of the treatment applied in a German sanatorium in which, says the author, 'the most distinguished

chiefs of state, savants, artists, and writers of Europe and America are treated . . . from the impulsive sovereign, who is supposed to be traveling in the fiords, to . . . the musician of genius who translates into accents of love the long tortures of abstinence.'

"The patient whose case is related was only what is called a 'petit morphinomane,' that is to say, he had taken morphia for only a year, and could have been weaned without any suffering by a proper method. As it was, the tortures inflicted on him almost reached the limit of human endurance. That they were by no means exceptional may be seen by comparing this case with that of the patient (No. X) related in Appendix No. 2, and treated by the same plan in a French Maison de Santé.

" 'I had had,' said the patient, 'my injection of 10 centigrammes—instead of 20—at eight o'clock. At eleven o'clock I already began to feel the craving for morphia. I tried to lose myself and asked for a book. They gave me Goethe's poems. I did not even open the volume, but remained horror-struck at the prospect of the long wait, which was to continue until four o'clock.

" 'At twelve I forced myself to eat, but was without appetite and the beer I drank seemed atrociously bitter. The malaise of craving has no equivalent in the normal sensation of hunger, thirst or yearning. It is a combination of all these and something more. Fourmillement of all the muscles, remeur in all the nerves. There is no rest for body or mind. I was obliged to get up and walk toward the ground-glass window, through which, however, I could see nothing. I would then return to the rocking-chair, counting the minutes one by one until exactly sixty had gone by. By this time it was half-past one.

" 'Fritz then advised me to take a second douche. I obeyed with no hope of relief, but whilst I was under the burning rain, surrounded by vapour, I forgot my wretchedness; . . . I was scarcely dry and returned to my room, when all my tortures recommenced.

" 'At three o'clock I was lying on the ground on my stomach, the only position which gave me any relief, trying to think of nothing, which is not easy when the word *opium* is engraved in every one of our cells in letters of fire. Time is an internal convention: the relation of the hour to the evolution of our environment. Desire increases or lessens it. Between half-past three and four, when Uberthurn came to see me, I could have affirmed that three months had elapsed—three months of anguish and despair. The king of this hell held in his hand his big syringe. . . . When I was free, I had only felt a short relief from an injection of 15 centigrammes; the present one, terribly reduced, gave me the most exquisite delight. Life returned tumultuously into my veins with its feeling of hope and emotion. The waves of physical appeasement passed through the body, the head and limbs, with voluptuous vibrations. I sought to restrain my tears in vain.'

"After a short respite the discomfort returned with renewed severity. The patient, whose case is described by Dr. Daudet, was unable to eat any dinner, and 'my state,' he says, 'was the same as during the afternoon, but with the aggravation of an almost continual nausea interrupted by sudden attacks of bilious vomiting.'

"He then tried the effect of a prolonged warm bath. This gave relief while he was in the water, but he was so prostrate afterward that it was necessary to carry him back to his room on a stretcher. After the 9 o'clock injection he went to sleep, but the want of morphia soon made itself felt.

" 'On three different occasions with marvellous patience my attendant took me to the bath, then to the douche, then back to the bath. Inert, I allowed him to do what he pleased. Calmed for a few seconds, then distressed by abominable cramps, and tortured by the idea, which had become an obsession, "If it is as bad as this now, what must I expect to-morrow and afterwards?" '

"His suffering becoming unbearable, it occurred to him to send for the doctor, but he was told it was quite useless to

expect him to come before the appointed time, as he never allowed himself to be disturbed except in the case of grave syncope. The idea then struck him to simulate a fainting fit, but he was ashamed, 'for what is allowable in an ordinary patient is not permitted to a medical man.' . . . From 12 to 3.30 P.M. he went a dozen times, either wheeled to the douche or managed to get there by supporting himself against the wall, his legs moving spasmodically like those of an ataxic. At 4 P.M. he was asked whether he would like 10 centigrammes of morphia at once, and none later, or 5 immediately and the same quantity in the evening. As a matter of course he asked for the larger dose.

"By dusk he felt quite as ill as if he had taken no morphine since the morning. 'Being torn by an immense void, trembling and unstrung.' The doctor then came to pass the night with him, and tried to amuse his patient by a philosophical discussion. He explained to him that opium acted upon by abolishing the latent suffering which he called the permanent anguish of life. In the meanwhile the patient was writhing and rolling on his bed, grasping and shaking the pillow.

" 'Feeling like Montezuma defending himself under the implacable eye of his jailers, the night dragged on interminably, and I answered only by groans to the solicitations of my attendant. . . . . Thoughts of my studies and of my readings came back to me by scraps with the titles in English and German: . . . "The Opium Habit and Its Treatment." . . . "Pathologie der Morphium Sucht." '

"Then came the same kind of hellish sensations which have been described by every writer since De Quincy. Finally, after an unsuccessful attempt at breaking into the dispensary to procure a larger dose of morphia, he was given his last 10 centigrammes by the doctor, who told him it would be his last dose.

" 'When one knows,' he said, 'that one is not to have any more, one is less unhappy than when the hope remains that more can be obtained.'

"The following twenty-four hours constituting the critical period of the treatment, the doctor promised to return shortly and remain the night. Half an hour afterwards the suffering had returned in full force.

" 'I was at the height of the crisis. I was sobbing and rolling on the floor in the middle of the room, whilst Fritz, the attendant, murmured sadly: "Cheer up, Doctor!" I would have given anything for a positive pain in some precise part of my body, but like a vessel in a black tempest I was attacked on every side but nowhere in particular. A general obsession held my brain and gnawed my entrails, accompanied by horrible vertigo, giddiness, and insomnia. Every instant I was obliged to change my position. At one moment crouching, then bending forwards, wrestling with myself on the ground, I felt at the same time an abominable lassitude and an imperious want of movement. My bones felt as if they were breaking. Phosphorescent flashes passed through my eyes, then came thirst, at first a simple dryness of the palate, but ultimately like a gimlet that was being thrust into the stomach.'

"During this phase of the torture drinking is forbidden, as it gives rise to incoercible vomiting, and the patient was allowed only to suck oranges. When at last matters had become as atrociously unbearable as possible, he was carried to the bath and drank as much water as he could swallow, which, whilst appeasing momentarily the intolerable thirst and bringing back life, brought with it the fury for the opium.

" 'On returning to the accursed chamber I vomited the two quarts I had imbibed with a violence that doubled me up. The doctor did not scold, but contented himself with saying, "You had better keep to the oranges; it is more prudent." '

"A little later things became worse still, and 'death seemed preferable to such an excess of suffering. I was, however, unable to decide whether I was completely or only partially desirous of it. I do not know whether I should have used a revolver had it been offered to me. I sought nevertheless for some means of

committing suicide. . . . . Then I got up and began to turn round like a circus horse. I fell down without doing myself any injury; then got up again and pushed the rocking-chair in front of me. These grotesque contortions occupied me until the approach of night, during which I made I don't know how many excursions to the douche. With broken, dislocated limbs, my mouth like a lime-kiln, the brain on fire, yearning after morphia like a lost child for its mother, with heart and senses full of this idea and murmuring the name, in the midst of my nightmare, I cursed the fit of courage that had brought me to this prison. I was one of those wretches upon whom Providence inflicts the torture of passing through successive ages without finding repose anywhere. I was the wandering morphinist.'

"These acute sufferings, which had continued for four days, came at last to an end. But after what is known as the 'deliverance' two months elapsed before the patient was able to leave the sanatorium. Experiencing the usual consequences of the brutal treatment to which he had been subjected, the following is his description of a syncope caused, as appears to be usual, from heart failure:—

" 'I tried to get up, but was obliged to lie down immediately on account of the vertigo. . . . . Objects appeared to me double. . . . . A little later I felt my heart getting slower. It seems as if I were dying in a strange sense of languor. I was recalled to life by the buzzing of an electric coil. Uberthurn was applying to my body moist pads which gave me violent shocks, whilst Fritz was making me breathe vinegar. In this way I went through the classical syncope of the thirtieth hour. I may say that it was without any satisfaction. A dull indifference, like a cloud of lead, weighed upon me and upon my moral horizon. My throat, still bitter and dry, was full of repressed sobs. I sighed to myself, "What is the use of it all?" '

"It is unnecessary to quote further at any length. The patient remained, after the syncope described, in a state of

prostration which lasted for eight days, during which his mental condition was one of hopeless apathy, 'taking no interest whatever in anything—Si ce n'etait tout a fait le gatisme c'en etait l'equivalent.' "

CHAPTER XX.

REVIEW OF LITERATURE (CONTINUED).

OSCAR JENNINGS, PARIS, FRANCE.

THIS entire chapter will be devoted to quotations from and a review of the writings of Jennings, who, in the opinion of the author, contributed more original and valuable suggestions to the literature on the treatment of morphinism than all other writers who lived and wrote during the nineteenth century.

Jennings's original work was done during the last two decades of the nineteenth century, and, while he is still living, he had not, up to a few years ago, materially changed the position announced in the first edition of his work. To the students of the literature of this subject his work is of the deepest interest and shows how closely an earnest searcher after truth may come to reaching the very truth, and yet miss it.

Jennings is a man of high attainments and fortunately,—or unfortunately,—the author is unable to say, was addicted to morphine himself. It is true that such an addiction was a misfortune to him, but a blessing to others. His addiction led him to make a careful, thorough, systematic study of drug addiction and to place on record the results of such study, illustrated by his own personal experience in carrying out the treatment devised by him upon himself, as well as upon others.

From this we have information at first hand and much of it of a most reliable type. Jennings, however,

was in error as to the pathology of morphinism, and, necessarily, his conclusions as to the manner in which the treatment he used effected a cure were faulty; however, his theory as to how his remedies acted did not prevent them from being of the greatest value.

In a clinical study of the subject he found by actual tests that persons using morphine had a hyperacid condition of the stomach. This he assumed to be due to a hyperproduction of hydrochloric acid. For the relief of this hyperacid condition of the stomach he administered bicarbonate of soda in large doses, usually a teaspoonful of soda or a draught of Vichy water equal to that, and this was repeated at frequent intervals during each day and for many days in succession.

He believed, and possibly still believes, that the neutralization of this excess of acids by the bicarbonate of soda overcame the pathological condition which he considered the essence of the craving, or, at least, one of the principal factors in the craving for morphine. It is evident from his writing that he considers the hyperacidity the essential pathology of morphinism.

Another means which he suggested, and used to good advantage, was a Turkish bath, but the explanation he gives of its therapeutic effect is that it aided in overcoming the hyperacid condition by the elimination of certain acid products from the blood.

Jennings practised the gradual-reduction method; in fact, a very gradual form of the gradual-reduction method.

Patients while undergoing that were observed very closely. The tendency to be restless and constantly seeking to be in motion was taken as an indication in the treatment. Jennings practised, and had his patients practise, motion in various forms, such as massage,

bicycle riding, walking, swinging in a hammock, sitting in a rocking chair; any kind of motion that was light and not fatiguing was encouraged.

It was his belief that by thus substituting mechanical stimulation for the morphine stimulation to which the nerve-centers had been accustomed the demand for the morphine was in a measure overcome. This measure of relief, in his opinion, being entirely due to mechanical excitation of the nerve-centers, which excitation took the place of and in a measure relieved the demand for drug stimulation.

Another symptom to which Jennings paid especial attention was the difficult and inefficient heart action. He attributed this, also, to the hyperacidity of the system. But in its treatment he pursued the most rational methods, and these gave much relief and helped him materially in effecting the cure of his patients.

Prior to Jennings's time, and by most writers since that time, the abstinence symptoms or demands for morphine by the system of the habitual user of it was looked upon as an unnatural and untreatable entity that had no real basis, except in the perversion of the will of the patient.

Jennings's study of his own case convinced him of the error of this conclusion and he undertook, as a rational medical man, to analyze the conditions present and to treat the patient accordingly.

While he considered the craving for the drug the principal factor to be contended with in the management of the case, he applied rational therapeutic measures to meeting the indication presented by the condition of the patient. He says that, in "analyzing this craving and speaking of what in another case would be called indications for treatment, he found that it was not, as it had

heretofore been allowed, an untreatable entity, but that it might be looked upon as the result of a number of component distresses and capable of being *split up into factors susceptible of entire or partial relief.*"

Thus he divests his mind of all superstitious ideas or preconceived notions and undertakes to *treat his patient* for the conditions present rather than mass the symptoms into an entity and treat that.

In the method he employed—the gradual-reduction—the craving, the imperious demand for relief of suffering and in some cases for the sensation of stimulation derived from the repeated doses of the morphine, is the most prominent factor presented by these cases; it is evident that all writers who advocate the gradual-reduction method overestimate the importance of this factor. It does not constitute the essence of the disease, as they suppose.

While Jennings cured his patients, it is evident that he did not cure them because the bicarbonate of soda neutralized the excess of hydrochloric acid; neither did the Turkish bath, by helping to excrete the excess of acid from the system alone, or the motion, by satisfying the demand of the system for stimulation, effect the cure.

These agents had a far more important bearing upon the real pathology involved in the undertaking than Jennings thought. Their action was not curative because of the effects he attributed to them.

After the quotations from Jennings's works which follow, the author will explain how each of these agents contributed to the cure of the patient in the light of the pathology of the condition as at present accepted:—

"It may seem an invidious thing to say, but I have no hesitation in declaring that before this there was no rational treatment

of the morphia craving founded upon therapeutic indications. There was, in fact, no treatment of the craving at all, which is tantamount to saying that there was no systematic treatment of the morphia habit.

"The so-called 'methods' described by contemporary writers consisted of suppressing the morphia suddenly, slowly, or semi-brusquely, but failure was always the final result. A certain number of those who could be persuaded to give up their liberty, when they did not die suddenly (Clifford Allbutt), or commit suicide (Levinstein), were, it is true, sometimes temporarily cured after indescribable sufferings. But the same ignorance, or rather indifference, concerning the means of alleviating the craving, extending to the means of preventing the discomforts that are liable to occur to those who are left to their own devices after the suppression, in nine cases out of ten the temporary suppression was followed by a speedy relapse.

"I will say at once, for I have long ceased to make any secret of the matter, that my first observations were made in my own case. The only treatments then known being the 'methods' just spoken of, I endeavored to analyze and to dissociate the different factors of the miserable wretchedness known as the 'morphia craving,' and to discover in them some indication of treatment. It soon became evident that to call an attempt at suppression—whether slowly or suddenly—a 'method' was an absurdity. The time element is merely one of the conditions of treatment, and the real question—that upon which the whole management of the suppression turns—is that of the possibility of attenuating and rendering bearable the craving. *Analysing, as I have said, this craving, and seeking for what in another case would be called 'indications of treatment,' I found it was not, as it had hitherto been allowed, an untreatable entity, but that it might be looked upon as the resultant of a number of component distresses, and capable of being split up into factors susceptible of entire or partial relief.*

"I remarked also that with the same doses and the same length of addiction, the discomforts felt by different patients differed greatly in severity, and that the craving was always increased at times by a certain number of errors and imprudences the morphia habitué always commits; and that it could be prevented, on the other hand, in a remarkable degree by certain dietetic and hygienic observances, and remedied by a number of means of treatment that result clearly from unmistakable therapeutic indications.

"It will be seen further on that every one of the treatments that I have proposed during the last fifteen years, as a consequence of these observations, has since been endorsed by other writers, and that the means I pointed out as resulting from therapeutic indications are now generally adopted by physicians treating this class of cases.

"Some writers have even gone so far as to adopt one of my means of treatment, and to magnify its importance into that of an adequate method by itself. Pichon thus credits me with the invention of the 'physiological method,' which consists of the administration of heart tonics alone.

"Erlenmeyer, too, has made a method of the administration of bicarbonate of soda, given to neutralize hyperacidity, and which he terms 'chemical demorphinisation.' But, unlike Pichon, he appropriates the discovery to himself, although I have been calling attention to this treatment, as will be seen further on, ever since my first publications, and had almost become tired of writing on the subject, before it had occurred to him. The Turkish bath has also been proposed as a complete treatment lately, but for the present I shall content myself with mentioning the fact.

"It is scarcely necessary to point out that if each of these plans, which alleviate one factor of the discomfort, has by itself been found efficacious as a cure in the hands of others, the three combined must give a greater certainty of success.

"The most important factors of the craving, as will be seen further on, *being heart depression, hyperacidity, and nervous irritability,* the relief of either of these conditions may be sufficient help to enable a patient who might otherwise be unsuccessful, to get well; but there will be a much better chance of recovery without suffering by the application simultaneously of the means that remedy each of these conditions, and so prevent or alleviate the craving in all its factors. It is like the old fable of the bundle of sticks which could not be broken as a whole, but which was easily disposed of when they were taken one by one.

"How far suffering can be prevented by the judicious application of the principles I have laid down depends upon the care that is taken, not only in punctually and exactly carrying out the treatment, but also in guarding against such imprudences or accidents as exaggerate craving.

"I can, however, now affirm that I have, during the last ten years, had abundant opportunity of verifying my earlier observations, and I can assert, without fear of contradiction, that when the line of conduct I indicate is followed intelligently, the craving can often be entirely prevented, and in every case attenuated to such an extent that it is as nothing in comparison with any other treatment,* and no longer constitutes a difficulty to anyone who is really desirous of giving up the addiction.

"* As an example of the 'failure' of my treatment I will mention the case of a young man sent to me because a complete result could not be obtained by the attending practitioner. The patient was taking sparteine, Vichy water, and hot-air baths, and was therefore supposed to be following my system, but could not get beyond the rectal-injection period. The only result had been the suppression of the syringe. I found upon questioning him that, although he knew that the whole treatment was intended to diminish acidity, he had not thought there was any objection to gorging at meals, swilling beer in the intervals, and emptying the larder at night of whatever it contained. He looked upon this régime as the best way of recuperating his strength. Whether it was self-indulgence, or merely a pretext for taking morphia, I do not know; but as he would not change his mode of life, I, of course, declined to have anything to do with his treatment." . . .

"A change of surroundings, however, is preferable, as morphia habitués are generally far more reasonable with strangers than with members of their own family, whom they tyrannize from force of habit. . . .

"There must be regularity as regards medicine; regularity with respect to meals; and last, but not least, regularity also with respect to repose.

"Whether sleep come at first or not, the light should be extinguished as soon as the last dose of the morphia has been taken, and reading in bed strictly forbidden. The pretext for reading in bed is the difficulty of sleeping, but in the morphia habit, even more than under ordinary circumstances, it is the habit of reading in bed that aggravates the insomnia. Whether the first few nights remain sleepless or not, the patient must try to woo back sleep by restoring night to its proper purpose, that of repose. It stands to reason, and I shall refer to this principle more fully further on, that if the morphia is expended in providing the intellectual energy necessary to enable the reading of a book to be enjoyed during the night, its effect in other directions is lost, and a larger quantity than otherwise need be is required to maintain a state of comfort. Those who know nothing about morphia will often suggest to a patient in a state of want to take a book and read. But morphia patients will know I am right when I say that such a recommendation is an absurdity. For them to be able to read it is necessary, not only to have the organs of vision and the intellectual centre, but also that organs and centre be bathed with a sufficiently strong solution of morphia. Reading in bed, then, although one of our patients' chief pleasures, must be given up, in order to make the morphia go as far as possible. . . .

"I endeavored to prove to him that the man who complains of the want of some little indulgence is not in the frame of mind requisite for successful treatment, for if he realizes at its proper price the inestimable happiness of the escape from morphia, he ought to be convinced that recovery is cheaply purchased at the

cost of a short temporary seclusion, coupled with some trifling interference with personal habits. . . .

"It is no part of my task to enter into the symptoms of chronic morphia poisoning; but, as my treatment is based upon a certain conception of the nature of the morphia craving, it will be as well to give at once my theory of its mechanism.

" 'I suppose,' I said, 'that the want of special stimulation, felt as the morphia craving-yearning, reduces itself physiologically to the requirement of a peculiar mode of molecular motion.' The condition of ordinary ennui which has been described as 'a sense of tedium in activity,' having its source in a want of mental occupation, or, in other words, the want of molecular change in certain cerebral centres, is intensified into the distress that results from 'the representation of a future in which such cravings will never be satisfied.' This 'dissatisfaction,' by inaction of the nervous system, is associated with the entoperipheral craving resulting from the diminished impulse to those organs, and more especially the heart, which subserve nerve activity. Each recurrence of the sensation is probably heightened by autosuggestion of the means of satisfaction, and by the abeyance of the controlling power of the will over the morbid automatism of the lower centers, which are polarised, as it were, into fixed yearning for the accustomed stimulant. From this tendency to an accustomed molecular motion on the one hand, and the enforced inaction from want of the necessary stimulant on the other, arises a condition of cellular unrest and fatigue, which has its exact counterpart in the external habitus of the patient.

"The feeling of intimate restlessness is accompanied by an impossibility for the individual to remain at repose; but if he seeks relief by walking about, he is soon forced by fatigue to sit or lie down on a couch or easy-chair, when no sooner has a suitable position been discovered than the renewed restlessness compels him to be up and moving.

"It is this imperious tendency to movement which shows itself also in involuntary startings, etc., that furnished me with one of

my first indications of treatment—a treatment which did me good service when I had nothing better, but which is interesting now only as showing the evolution of my method. Energy resulting from the accustomed pharmacodynamic stimulus is required to give full satisfaction to the morphia habitué, *but motion in all its modes is a sedative to the craving, providing always that it be not carried to fatigue.*

"Starting from this point, I treated my first case by the application of different physical stimulations, such as faradization, massage, dry friction, heat, galvanism, etc., towards the end of the progressive reduction, and I found that I was able to effect sufficient breaks in the monotony of the yearning to enable the patient to wait for his decreasing doses with patience. What is generally so profoundly discouraging to a morphia patient is the certainty that once the craving is felt, it will go on with increasing distress until the morphia is administered. In the case I allude to, as the doses became less frequent and less considerable, the periods of relative comfort became, as is always the case, shorter and shorter, and a strong desire for the morphia was felt hours before the time appointed for the injection. Although other medicines had been taken in the course of the reduction, at the time the physical-stimulation plan was tried, the only drugs used were bromide, valerianate of ammonia, and bicarbonate of soda. The result of the experiment was entirely successful. The patient who had taken morphia for five years, and cocaine for a year and a half, latterly in doses of over 20 grains a day of each, and who had failed, moreover, previously on two occasions on the very brink of success, managed to come triumphantly through the ordeal. Besides the different stimulations and medicines mentioned, he also made great use of the hammock, in which he would lie exposing his limbs for hours together to the broiling sun.

"It was upon this theory of the substitution of another stimulus to the brain cells for the accustomed one that I was

led to use trinitrine, and afterwards nitrite of amyl. Although these agents have a powerful action on the heart, it was not on this account that I selected them, and, indeed, if a medicine could be found exercising a similar action upon the blood-vessels, without stimulating the heart, it would be preferable. What the heart requires is a tonic rather than a stimulant, the action of which is always followed by a corresponding depression.

"*The second indication of treatment is to be found in the state of the heart,* which participates *in the general vital stoppage, giving rise, by its sluggish action, to some of the most distressing symptoms.* . . .

"The most important functional disturbance as regards the craving *is the hypersecretion of acid in the stomach* during suppression, which obviously suggests the administration of bicarbonate of soda. This is discussed in another chapter.

"To sum up, the want of morphia makes itself *felt* chiefly in three directions—(1) a condition of restlessness, and sometimes of pain, *depending upon the want of an artificial stimulus to the brain cells,* which has become, as it were, so indispensable to function that it almost represents vital force; (2) by *a failure of the heart's action* and a sluggishness of the circulation, *caused by the want of the natural nervous influx to the heart,* and also by the lessening of the *vis a fronte* through the suspension of the chemicovital processes in the tissues; (3) *an excessive secretion of acid in the stomach.* Given at the proper time, the suitable means are quite competent to allay all craving. *But for the cure of morphia habit something more is necessary.* . . .

"But irritable and restless as a man accustomed to other stimulants may feel for a few days after they have been given up, it is nothing to compare with the vital stoppage resulting from the sudden or too rapid cessation of morphia. It is no exaggeration to say that the unfortunate victims of the habit are wholly and absolutely dependent upon their accustomed stimulant; so

much so that it has almost become a condition of existence. The heart will scarcely beat without it, the brain only thinks by it, and digestion is entirely dependent upon it. In a word, morphia to its unfortunate slaves is the synonym of vital force.

"It might seem, then, that there is but little chance of escape from a thraldom so complete, or that, at the very least, it must be necessary to employ restraint. Such was the practical conclusion of a discussion at one of the medical societies in London, and such is the opinion, as I have already said, of the leading alienists. A physician, quoted by Dr. Mattison, expresses himself as follows: 'Let him (the patient) quit it short, absolute and entirely. If he have the will power, trust him; if he cheats, lock him up, put a Hercules over him as a nurse.' As it is absolutely certain that no one whose addiction is of sufficient standing to warrant the expression 'morphia habitué' could leave it off suddenly by an effort of the will, the Herculean nurse would become a necessity. Here is a picture of the treatment by the same authority: 'All substitutes are simply a prolongation of the agony he must go through. . . . . The patient who quits morphia after a long-established habit suffers from insomnia, diarrhea, nausea, vomiting, achings all over, and debility to such a degree that it is a marvel how he lives. . . . . All this suffering will last from five to ten days. No medicine will do any good; the stomach rejects everything, even a mouthful of cold water. . . . . At last, after several centuries of torture, little by little, and without medicine or substitutes, nature accomplishes the cure. This terrible treatment, I am sure, is not only the best, but the only safe one to cure, and secure the patient from relapse.'

"Dr. Mattison very properly protests against this 'brutal, barbarous, and inhuman plan of treatment,' and shows how mistaken are these statements. The most important objection, to my mind, is that, dreadful as are the tortures inflicted, they do not, as a matter of fact, afford any safeguard against a relapse. . . .

"In my early cases, the object aimed at being the suppression of morphia, the patients were allowed too much latitude in other respects. Nearly every morphia habitué is sufficiently well acquainted with the literature of the subject to be more than a match in discussion for anyone who has not a special knowledge of the subject. So it was that, when I first began to make the treatment of the morphia habit a special study, although I had the very best reasons for thinking that certain practices were imprudent, my patients were always able to quote some acknowledged authority in favour of their course of conduct. One maintained that he was helped by large doses of alcohol—an error, notwithstanding the books that endorse this opinion; for if the immediate effect is stimulating, the subsequent reaction makes a larger dose of morphia necessary to combat the depression of the heart and vasomotors. Another would insist upon having chloral at discretion. A third, without appetite as a rule, would be seized with a sudden fit of boulimia, and eat a heavy, indigestible meal in the middle of the night, afterwards suffering from dyspepsia, for which the proper treatment would be an emetic, but for which a morphia habitué always exacts an extra dose of morphia. . . .

"The three preceding chapters have been almost textually reproduced from my 'Cure of the Morphia Habit' of 1890, and from these, and from the passages which are quoted further on, it is evident that every element of the treatment I employ at present had been already used by me at that date.

"I call attention to this, for, although the greater number of writers on this question have fully recognized my claims in this matter, certain practitioners, as I have said before, have found it more convenient to take my methods without acknowledgment than to devise treatments of their own, and have even gone so far as to claim the invention of these treatments for themselves.

"This has been the case for the bicarbonate of soda treatment, the importance of which will be seen further on, and also for the use of the Turkish bath, which an irregular practitioner is also exploiting as his own idea.

"Believing as I do that my method is really what it has been termed, the *physiological* one, the necessity of establishing clearly my priority as regards these means of treatment must serve as an excuse for the repetition which the description of them as applied at present renders unavoidable. With these remarks, I pass on to the consideration of my actual mode of treatment.

"When the morphia is associated with some other addiction, the first thing is to suppress the other stimulant, whatever it may be. If it be alcohol or cocaine, there is no difficulty worth speaking of in so doing; indeed, the quantity of morphia taken becomes more satisfying, being no longer antidoted, as it were, in a certain degree by the other stimulants as when they are taken. A medical man in London who consulted me by letter was astonished when I told him he could give up the cocaine without trouble, having been accustomed to look upon this as the most difficult part of his addiction. He wrote shortly after to say that he had not experienced the slightest difficulty in carrying out my instructions. . . .

"As regards the rate of reduction, I have always been a partisan of gradual progression; but the actual time necessary for the cure of any given case depends entirely upon the thoroughness with which the craving can be prevented by the means adopted. Starting from the fact that it is possible, without any other treatment whatever, to wean a person of the morphia habit without his knowledge by a sufficiently slow progressive reduction, it is evident the slower the reduction, the less distressing is likely to be the craving. The plan I have adopted is to proceed as fast as possible, but *as slowly as is necessary, to effect a cure without distress.* If there were no other means of relieving the craving, the treatment would resolve itself then into a suppression sufficiently gradual for each patient, but this is no longer the case.

"The next great factor of the craving is hyperacidity of the stomach and organism generally, and this naturally suggests as a treatment the administration of bicarbonate of soda. For thirteen

years I have been calling attention to this fact in English publications, and although still apparently unknown in England, its importance is now recognized by every writer on the Continent, Professor Joffroy, of the Paris School of Medicine, being the last one to endorse it and to recognize my claims to its authorship. It may seem strange to make a therapeutic agent like bicarbonate of soda play an important part in the treatment of the morphia habit, but some go even further than this and make it little less than a panacea. Erlenmeyer, who labours under the impression that he was the first, in 1895, to suggest its use, as I have said already, has even given this means of treatment the name of 'chemical demorphinisation.' As I pointed out in four different publications before that date that hyperacidity was an important factor of the craving, and insisted in each instance upon the value of bicarbonate, the only thing that can be claimed truly by Erlenmeyer is to have given a high-sounding name to one of my discoveries, and to have correspondingly exaggerated its importance. . . .

"Bicarbonate relieves the craving in so far as it is caused by overacidity, in the same way that heart tonics relieve it, *quâ* cardiac sluggishness, and nothing more, but it is none the less satisfactory to find that according to others I have here again understated, rather than exaggerated, the value of my treatment. . . .

"Various other means of relief may be applied according to symptomatic indications, but the last of my therapeutic triad is the hot-air bath. . . .'

"And further on:—

" 'The moderate restlessness which occurs when patients are properly treated disappears entirely in the hot room of the Turkish bath; and the subsequent massage and cold douche form the most perfect sedative that a morphia patient can be allowed. There is no better means, moreover, of dealing with the revival of the craving that occurs from time to time, especially under the influence of indigestion.'

"In several of the cases reported, moreover, its use is especially noted; it is mentioned in one that for the last week the patient took Turkish baths regularly.

"As a matter of fact, I used the Turkish baths long before 1890, for in a reprint of my paper in the *Encephale,* in 1887, I stated it was 'an excellent means of calming the agitation caused by attempts at suppression, giving rise to sensations that resemble morphia, and being followed by lassitude most agreeable to the agitated.'

"And speaking of the after-treatment of the case on which the paper is founded:—

" 'Whenever the necessity of a tonic or a calmant is felt, he has recourse to the Turkish bath, and it would be difficult to find a more efficacious means.'

"In the *Medical Annual* (1894) I am even more emphatic as to its value and to its importance as a regular part of my method. And here again I have certainly not overstated my case, for the author of a Montpellier thesis makes alternate douching with hot and cold water a method by itself, and there is now an institution for the cure of the morphine habit by hot-air baths alone. It is highly probable that other means are used concurrently, for however valuable the hot-air bath may be, the cure will never be too easy, and there can be no reason for rejecting any one of the means that have been proved to be useful. In a recent case, wishing to test the value of the baths alone, a very unmanageable patient of mine was submitted to this treatment, but he contrived to cheat, and it did not prove nearly as satisfactory as the exponent of this treatment, who was directing it, had promised. Being afterwards placed under conditions which prevented all deception, the system of rectal injections with bicarbonate of soda was substituted, and he was cured without knowing when he had passed the Rubicon. I am not desirous, in alluding to this case, of detracting from the value of the hot-air bath, inasmuch as here again, whatever may be its value, the idea is my own,

and forms an integral part of my method of treatment. It is better, however, not to expect from it more than it can do, and in most cases, however great the relief obtainable from the bath, it stands to reason that it cannot be as helpful alone as the association of the three different means corresponding to the three chief indications of treatment.

"The effect of the bath is due in part no doubt largely to its tonic and sedative action, *but it may also act as an eliminator of some excitant of craving. This may possibly be the oxydimorphine which is formed in the body, and considered by Marme as its chief cause,* experiment having shown that oxydimorphine when injected into the system in a virgin subject produces the symptoms of craving. It may be also, as I have always maintained, that it is a moderator of acidity, and this would explain its value in the after-treatment, when the ex-habitué, unless extremely abstemious, is saturated with acidity, and when it would be difficult to explain the spurious cravings by oxydimorphine.* . . .

"The three means of treatment that have been chiefly discussed up to the present—heart tonics, bicarbonate of soda, and hot-air baths—constitute the therapeutic triad that, together with the special mode of reductions by means of rectal injections, make up the method I advocate."

AUTHOR'S COMMENT.

The proposition advanced by Jennings is in effect that the presence of an excess of hydrochloric acid in the

"* It has been thought that the hot-air bath might act as an eliminator in chronic conditions associated with uric acid, but insignificant quantities only have been excreted by forced sweating. Until it is otherwise demonstrated I shall continue to look upon the factor of the craving that is remedied by the hot-air bath as mainly a 'state of the body,' much more than a 'something to be excreted.' The hyperacidity is due to a depression of function, as is also the heart-failure; and it is also by remedying functional depression that the hot-air bath is chiefly useful." . . .

stomach is due to a hyperproduction of hydrochloric acid, and that this is the pathology of the addiction.

Hydrochloric acid is a normal digestive secretion and its presence in the stomach is essential to stomach digestion. It may be produced in excess or there may be underproduction. But even when there is not a normal quantity secreted, there may be more than a normal quantity in the stomach.

When stomach digestion is completed the entire stomach content is a strongly acid solution, the acidity being due to the presence of hydrochloric acid. This strongly acid solution is passed into the duodenum and there it comes in contact with the alkaline secretion from the liver and pancreas. These neutralize the excess of acids and then the other parts of the meal, which are not digestible in the presence of an acid medium, are digested by the action of the pancreatic and hepatic secretions.

Now, the presence of an excess of hydrochloric acid may be due either to an underconsumption or overproduction of hydrochloric acid. The presence of an excess of acid in the stomach of morphine habitués is evidently due to underconsumption of acid rather than to overproduction.

The restricted intestinal motion, the semiparalyzed condition of that tube, does not admit of the ready downward passage of the stomach contents. This semiparalyzed condition of the intestinal tube dams back and forces the too-long retention of the stomach contents. The delayed passage of this food from the stomach probably excited some additional secretion of hydrochloric acid, but this would not have been sufficient to be considered an excess had intestinal motion been such as to have permitted the prompt downward passage of stomach contents.

It was, in the author's opinion, this underconsumption or delayed consumption of hydrochloric acid which Jennings saw and regarded as the pathology of morphinism.

When the motility of the intestinal canal is thoroughly excited and maintained, hyperchlorhydria is not present in morphine habitués, either while taking morphine or under treatment for addiction. But someone will ask, If this is the case how did Jennings's bicarbonate of soda help cure his patients?

We have seen in the earlier chapters of this work that the essential pathology of drug addiction is a toxemia, the toxins being of drug, intestinal, and autoorigin; that the system is intensely saturated with poisons of all these types, and that their elimination prevents most of the symptoms incident to the withdrawal of morphine. This elimination is carried out principally through the bowel by the effects of purgatives.

Now, in the administration of bicarbonate of soda, Jennings never thought of giving a purgative; he was giving an antacid. He believed that its antacid effect was that which proved beneficial to his patients.

Teaspoonful doses of bicarbonate of soda taken into the stomach in the presence of an excess of hydrochloric acid not only neutralize the acid, but in neutralizing it bicarbonate of soda is broken up and chloride of sodium formed in its stead. Now, the chloride of sodium is one of the most reliable of the saline cathartics. It does not act so promptly or so freely as some of the other salines, but its action is equally sure.

This action carries away not only the excess of acid and other products in the upper part of the intestinal canal, but empties the canal, producing a reliable degree of peristalsis.

The frequent repetition of these doses of bicarbonate of soda kept up free elimination by the bowel, and it was in that way rather than in neutralizing the acid that Jennings's treatment benefited the patient.

The same is true of the Turkish bath. That is to say, the Turkish bath promoted free diaphoresis, and that action took out through the pores of the skin large quantities of toxic matter, not only the excess of acids, if present, but of all other toxins with which the patient was saturated.

These toxins were not necessarily acid; in fact, it is doubtful whether they were acid at all; there possibly was a small amount of free uric acid in the blood, but, aside from that, the blood would hardly contain free acids, being an alkaline solution.

But the blood, as well as every gland and cell in the body, was saturated with toxic matter and the free sweating in the Turkish bath carried off large quantities of these toxins, and the patient was relieved of the distress due to their irritating effect on the central nervous system.

Again, the benefits derived from continuous motion, massage, etc., were of the same character. Instead of this substitution of mechanical for drug stimulation merely satisfying these centers by supplying stimulation, to which they had been accustomed, this stimulation excited greater activity of these centers.

This increased activity caused them to generate and send to all the structures more efficient motor, secretory, and excretory impulses, thereby stimulating all the excretory organs and causing them to throw off a larger quantity of the toxic matter with which the system was surcharged, and it was in this way that free motility benefited his patients.

Doubtless the stimulation of the disordered nerve-centers did bring a measure of temporary relief, but its principal curative value was evidently due to the increased elimination which it promoted.

Thus, we see that, from all three of his means of relief for craving or distress, we have the same resulting effect—that of elimination, and elimination is the sheet-anchor, in fact the bed rock, of the successful treatment of toxic conditions, of which morphinism is the most striking example.

The author feels sure that Jennings's explanation of the difficult heart action was also erroneous. He attributes "difficult heart action, failure of heart action, and sluggish circulation to want of natural nervous influx to the heart and also to the lessening of the *vis a fronto* through the suspension of the chemicovital process."

It is evident that this does not account for that symptom, since it is not seen at all when the system is cleansed of the toxic matter and the portal system disengorged.

In the treatment of a narcotic habitué when the primary step in the treatment is to thoroughly cleanse the system of toxic matter by sufficient, well-directed courses of purgation, by which the portal engorgement is also overcome, the heart action is not in any wise embarrassed and the circulation, instead of being inefficient and unreliable, is very much better than when morphine was being regularly used.

Again, as soon as the intestinal canal is brought into active motility by stimulation of the motor centers with strychnine, the secretions of the stomach and the upper part of the intestinal canal are promptly carried downward. The acid contents of the stomach are brought into contact with the alkaline secretions in the intestines

and the acid is there neutralized. When this is done, and as soon as it is done, the hyperacid condition present at the beginning disappears entirely and is not afterward seen; that is, it is not afterward seen if the bowel is kept acting normally.

In fact, after that, instead of there being an excess of hydrochloric acid, in many cases the author has found it deficient, and, as a remedy, has frequently administered hydrochloric acid, with the very best results.

These clinical results show clearly that in Jennings's case the hyperacidity was due to underconsumption of hydrochloric acid rather than to an overproduction of it.

Not only that, but the relief of the portal system, the cleansing of the system from toxic matter, overcomes most of the other distressing reactionary symptoms that attend the withdrawal of morphine. The symptoms of a nervous and mental character continue for two or three days, that is, until the secondary effects of morphine become exhausted, and then these subside without further treatment, and no craving for the drug remains.

It is true the patient is anemic and must be built up from the rundown condition induced by the morphine, but he is placid, can lie quietly on the bed, passes his time in comfort, and eats and digests a liberal quantity of nourishment. It is true, if he overtaxes his digestive organs, and, as a consequence, there is an acetic fermentation, he will have a hyperacid condition of the stomach, but it will not be hyperchlorhydria; it would be simply an acetic fermentation as in any other case of acute indigestion. This condition is promptly relieved by an emetic or an active cathartic.

It is really surprising, when one reads Jennings's excellent work, to see how nearly he came to reaching

the conclusion that the toxic condition of the system was the cause of all the distressing symptoms, and yet how utterly he failed to recognize that fact. He is to be congratulated, however, on the thoroughness with which he studied the subject, and especially his own case, and with the accuracy with which he recorded the conditions presented.

He is also to be congratulated upon the results obtained in the treatment of these cases when he was handicapped by error as to the real pathology of the conditions with which he was contending, his treatment, strictly speaking, being empirical.

The means he used were such as would have been helpful had he had a clearer view of the pathology, but they are not the ones upon which he would likely have placed his main dependence had a clear conception of the pathology been his.

The fact that all these symptoms against which he strove so constantly disappear when the toxic condition of the system is overcome is the best proof the author has to offer as to the correctness of his views of the pathology.

The author considers it a fortunate thing that he had not read Jennings's work before he undertook his original clinical study of this subject, because, had he done so, he might have been influenced by the doctor's views to such a degree as to have missed the object of his study—the determination of the real pathology of narcotic disease and devising a rational treatment for the same.

As it was, having fully satisfied himself that the teachings of the writers whose works he had read were totally erroneous, he was left with his mind a blank, as it were, on the subject and in condition to pursue his

investigation guided only by the general principles of medicine.

After having read some of the author's papers Jennings, in 1906, mailed him a copy of his book, English edition of 1901, and this was the first that the author had seen of Jennings's work. The conclusions of Jennings and the author, as to the effects and value of sparteine in these cases, are identical, but each was based upon his own clinical study, the author having been led to try the use of sparteine by the teachings of Bartholow.

CHAPTER XXI.

REVIEW OF LITERATURE (CONTINUED).

AMERICAN.

UP to within the last few years no American author had announced the holding of views which differed materially from the recorded views of the European writers; in fact, the views of the European writers seem to have been accepted as final, and they were simply reiterated by those Americans who thought it worth while to write anything at all on the subject.

The author will not undertake to reproduce extensively the writings of American authors. There has been such unanimity of opinion among them until a very recent date that one article, taken from Osler's "Modern Medicine," may be regarded as fairly representative of all.

This article is selected partly because its author, Alexander Lambert, has lately made other contributions to the literature of this subject, which writings will be considered later in this chapter. This article, taken with Lambert's more recent writings, gives a more clear idea of his position.

OSLER'S "MODERN MEDICINE."
ARTICLE BY ALEXANDER LAMBERT.

"Indulgence in morphia is a vice of recent years; it has taken the place, especially in large cities, of the preparations of crude opium. The readiness and cheapness with which morphia can be obtained and the ease with which hypodermic syringes can be bought have made this vice a widespread curse. . . .

"The hypodermic use of morphia is the most seductive form of the habit and the hardest to break; some patients seem to require the sensation of the needle-thrust in order to be satisfied. What is sought in most cases is the feeling of exaltation, strength, and mental vigor, with relief from pain or ennui, the drowning of sorrow, or the killing of the hopeless realization of despair and failure. Morphia does this as long as the desired effect lasts. The duration of this varies in different individuals and is longer in the beginning because the toleration for the drug is rapidly acquired and the time between doses must be continually shortened or the dosage increased, and finally both of these means must be used to obtain the desired results. . . .

"In the morphia addictee there are practically three stages, which, although shading into each other, can still be recognized: exaltation, intoxication, and cachexia. The first is one of enjoyment, happiness, and satisfaction. When the effect has subsided it is followed by malaise, a feeling of restiveness, and painful anxiety, which a renewal of the dose takes away. The effects of a single dose will sometimes last for twenty-four hours, but this is soon reduced to twelve, then to six, then to three hours, then to minutes instead of hours, and, finally, the exaltation ceases, and he must take the drug to quiet the intense craving and the pains of abstinence. . . . Morphinists will invariably lie about their vice, because in the early stages they feel the disgrace and have enough moral sense left to endeavor to hide it. If, however, they have just taken their morphia or are assured of sufficient dosage to keep them comfortable, they do not necessarily lie about other matters. But when the craving for the drug is upon them, there is nothing to which they will not stoop to obtain it. Lying, thieving, begging in the street, prostitution itself, are to them all justifiable means to obtain the drug and smother the irresistible craving. . . .

"The reflexes are very variable. Disturbances of the general sensibility are often marked and vary greatly; there are often

paresthesias and sometimes intense neuralgic pains. Others show marked anesthesia, which may be confined to one side of the body. More often there is hyperesthesia, and the sole of the foot becomes so painful that, when it is touched to the floor, it gives a sensation of burning, and the patient can only walk with short, jumping steps. Rodet considers this form of hyperesthesia as very characteristic of chronic morphinism. The tactile sensibility is usually diminished or abolished. . . .

"Troubles of digestion are among those most noticed by the patients themselves; in the early stages there is nausea, vomiting, and anorexia, which do not persist for a very long time. There is often an intense thirst; the breath is very offensive and of a peculiar odor, often spoken of as being so characteristic as to designate the morphinist by those who are brought in contact with many of these patients. They are markedly constipated and this often alternates with attacks of diarrhea; their stools are bloody and, during the period of constipation, may be as infrequent as once or twice a month. . . .

"When once a person is thoroughly under the influence of the habit, a cessation of the use of the drug produces symptoms, both physical and mental, of such intensity that few are strong enough to resist the craving thus produced and, unaided, break off the habit. When the effects of the last injection begin to wear off, restlessness, malaise, yawning, and sneezing appear; the craving increases and can only be entirely relieved by a further dose. The length of time, after the last dose, at which these symptoms will begin depends on the individual. Following quickly on the malaise, the eyes begin to water and the eyelids droop. The eyes lose their lustre and vision is much disturbed. The face becomes pale and an expression of intense distress is very noticeable. Hearing is diminished and there is a mental hebetude which prevents all intellectual work. There is a trembling of the hands and of the arm in supination and pronation, varying markedly from the alcoholic tremor. In this condition

there is nothing that morphinists will not do, and no means that they will not employ, in order to obtain morphia. As enforced abstinence continues, the patient may develop epileptiform attacks or hysteria, or there may be, in neurotic individuals, a state of choreic jactitation. In extreme cases a form of mania may develop in which the patients pace the room, shrieking, crying, throwing themselves about, using whatever instrument comes to hand to commit suicide, or they may attack their attendants. Hallucinations of sight and hearing may develop and these are always of a terrifying nature. This is most frequently seen in those who have taken alcohol with their morphia, but it not infrequently develops in those who have taken morphia alone. Often, before these mental disturbances are fully developed, the patients are overcome with a sensation of extreme weakness and forced to keep in bed. They are pale and haggard; there is nausea and vomiting, and almost invariably a diarrhea develops, which may become extremely profuse. This is often accompanied with intense abdominal pain and hyperesthesia of the skin, so that the patient can scarcely support the weight of the bedclothes; the body is often covered with a cold sweat, and there may be chills of great intensity.

"When morphia is cut off abruptly there is great danger of collapse. This may supervene on the second or third day and the patient shows increased weakness, appears pinched and haggard, while the pulse becomes small and then disappears. Or he may show a sudden high pulse tension, feebleness of the heart action, and suddenly, while wandering restlessly around the room, fall pulseless to the floor. Sometimes the fatal collapse may occur without warning while the patient is quietly talking or sitting in bed. Still another form of collapse may occur; the face becomes deep red, the eyes shine brilliantly, the pulse falls to 40, and the patient loses consciousness after a feeling of intense agony. These collapses may last for fifteen or twenty minutes; they may recur three or four times in the twenty-four hours, and the

patient may recover or he may die in any of them unless morphia is given. Fortunately these attacks are rare when the drug is withdrawn gradually, but they are fairly common when this is done abruptly. . . .

"*Treatment.*—The question often arises, whether the patient should be sent to some retreat, or whether a successful issue can be followed out at home. If the home treatment is decided upon, the family must be made to realize that they are dealing with the most cunning and cleverly deceptive kind of individual, who will stop at nothing, and who is probably concealing somewhere a supply of morphia. The suffering may be intense and will certainly be intentionally increased in order to obtain sympathy and to break off the treatment whenever it is possible. . . . In retreats or hospitals, the sufferings can be reduced to a minimum and when it is possible the treatment should always be carried on in some such institution. The question of the abrupt withdrawal or the slow method always comes into consideration. Levinstein, who used the abrupt method, says that he does not believe that this should be done unless the patient is otherwise healthy and suffering only from the symptoms due to morphia. This in itself shows the intensity of the strain and suffering that the abrupt method induces, and the danger of a collapse, which may be fatal, is most apt to occur in this method. The rapid method, by which the morphia is reduced to half the accustomed dose the first day and then half the next day and so in a few days is entirely withdrawn, is practicable in the majority of cases. The slow method, by which the drug is very gradually withdrawn, is useful for the very weak patients or those who suffer from some chronic disease and have gradually become addicted to excessive use. But in patients who are not afflicted with any chronic disease, it is apt to be extremely tedious and trying, really prolongs the suffering, and may discourage the patient, the physician, and the family.

"The best method in the majority of cases is to endeavor to find approximately how much morphia the patient has been

accustomed to and cut it at least in half and give this amount in divided doses for the first twenty-four hours. . . . The best drug to equalize the circulation and to reduce the physical craving and suffering to a minimum is the subcutaneous use of Livingston's solution of ergot as described under alcoholism. To allay the nervousness, warm baths are often very efficacious. Kane recommends that they be given at a temperature of 112° F., and the patient rubbed down quickly, placed in bed, and covered up warmly. To combat the insomnia, cold packs are often useful. A tonic of nux vomica and compound tincture of cinchona with capsicum, given three or four times a day, is of great assistance. Often in the first few days champagne or sherry is helpful, but this should not be prolonged, for these patients are as prone to take up other habits as they were originally to take to morphia. Chloral as a hypnotic has been condemned by most writers. Levinstein says that it tends to increase the excitement. Kane recommends bromides, given in large amounts of water, even in 100-grain doses. The patient should be fed with koumyss and eggs as the most easily assimilated food." . . .

The fact that so eminent a man as Osler selected Lambert to write the article on morphinism for his "Modern Medicine" is an announcement to the profession that Lambert is regarded as a man competent to speak with authority on that subject. It is doubtless true that Lambert has had a large number of alcohol and drug patients in his service, and that this afforded ample opportunity for the study of such cases, but Lambert's writings do not show that he has profited much by that opportunity. He does not seem to have advanced in his knowledge as to the real nature of the condition, the pathology of the drug disease, beyond the position generally held by the profession.

He, in common with the profession generally, holds that morphinism is a mere vice, and that the dominating

factor in it, the essential element to be overcome by treatment, is the unnatural craving for the narcotic.

This straw man, this unnatural appetite or craving, supposedly the result of indulged vice, is set up, and around it is woven a mass of error not to be found elsewhere in medical literature. The failure to acquire and hold clean-cut ideas, definite knowledge, as to the pathology of narcotic addiction has left the profession in a most vulnerable position, one in which they were not only not able to combat error, but in which they were easily misled by the spacious claims of anyone who had the effrontery to announce the discovery a "cure," a "specific," for drug addiction.

Lambert is no exception to the rule, and it is quite evident to all who have had extensive experience in the treatment of patients of this class that he has been "taken in" by a shrewd layman with his "specific" and has been led, erroneously, to proclaim it to the profession as such.

Lambert's article was published in the *Journal of the American Medical Association* of Sept. 25, 1909, under the title "The Obliteration of the Craving for Narcotics." As the author expects to point out a number of things in that article which he deems erroneous and which are calculated to lead those who follow its teaching into serious complications, he thinks it best to reproduce in full that part of Lambert's article relating to the treatment of drug cases. It is as follows:—

"If some years ago anyone had told me that it was possible to take away the desire for morphin, cocain, or alcohol in less than five days with a minimum of discomfort and suffering to the patient, I should have felt justified in treating the statement with a polite skepticism. Such, however, is the fact, if the treatment which is about to be described in this article is carefully carried

out. I do not doubt that in my turn I shall be met with skepticism, and perhaps ridicule, and more especially from those members of the profession who have struggled and toiled to break up the morphin and cocain habits. Heretofore there has been nothing so discouraging, so trying to both physician and patient, as the endeavor to eradicate the craving for these drugs.

"In my service in the alcoholic wards of Bellevue Hospital most of the patients were simply in the various stages and degrees of alcoholism, but there was always about 1 per cent. among the men and 2 per cent. among the women who were addicted to morphin and cocain. Many of these patients did not wish to be cured; many did earnestly desire to be rid of their enslaving habit. Many were the forms of treatment and drugs with which I tried to break off the habit and take away the craving. In a very few cases I sometimes believed that I had succeeded, but even in these cases there is always a doubt in my mind. In the vast majority of patients I know that I failed.

"Five years ago Mr. Charles B. Towns, of New York City, informed me that he had a treatment by the use of which it was possible in about three days to remove the craving for morphin and cocain and also for alcohol. After this desire for the narcotics was gone the patients would be able to remain free from the use of morphin, and if it was worth while to the patients it is possible for them to abstain from the use of cocain and alcohol. Mr. Towns, not being a physician, was not bound to tell me the ingredients of this treatment. I begged him to publish it and to put it on an ethical basis, as otherwise I could not use it, but at that time it did not seem expedient for him to do so. Recently he has made the treatment known in all its details to the Opium Congress at Shanghai, and on his return from China he has given me the full details of the treatment and I have been using it in Bellevue Hospital during the last two months.

"While the treatment was still unknown to me, and before I used it, I watched Mr. Towns treat various persons addicted to

morphin, cocain and alcohol, and found that the claims that he made for the treatment were true. I have, therefore, watched patients who ceased the use of their drug five years ago and have not returned to it, and recently I have myself carried out the treatment indicated below.

"There are so many factors to be considered in treating those addicted to narcotic drugs that there is no intention here to claim an infallible cure. We are dealing very often with the morally perverted, with those who have been suffering mental and physical pain, with those who have endeavored to stimulate their flagging abilities to ward off failure in life and to spur themselves on by means of these drugs in the hope of succeeding where failure seemed inevitable. Every morphin habitué knows the ease and sureness with which morphin will relieve pain and distress, and if once off the drug and the temptation returns there is a full knowledge of how it may all be relieved. There is no stimulant like cocain, which so fully gives the feeling of being able to do all that one hopes and dreams possible; and there is no drug which so gives the feeling of physical and mental well-being. Added to this, after a few months' use of cocain there arises a form of persecutory insanity, which convinces those addicted to the drug that every one in all the world is against them, and they refuse to listen to any advice. Most alcoholics do not desire to cease from their drinking. When once the habit becomes thoroughly formed they do not become drunk from haphazard drinking, but they deliberately drink to excess that they may blunt the knowledge of their unhappiness and the realization of their misery and their environment. Alcohol also in many cases brings with it actual physical lesions in the nervous tissues, so that with a deteriorated mentality the higher functions of the mind are destroyed.

"The specific in this treatment is the old 15 per cent. tincture of belladonna and the fluid extract of xanthoxylum (of prickly ash) and the fluid extract of hyoscyamus mixed in the following proportions:—

	Gm. or c.c.	
℞ Tincturæ belladonnæ	62	ʒij.
Fluidextracti xanthoxyli,		
Fluidextracti hyoscyami .....āā	31	ʒj.

"While this specific is being given, the patients do not suffer from the intense diarrhea which usually accompanies the withdrawal of morphin. On the contrary, the most energetic, drastic cathartic medication is necessary to obtain the desired elimination and to make their bowels move satisfactorily. This cathartic medication forms one of the crucial points in the treatment. Unless it is properly carried out the treatment will fail and the patient suffer intensely and to no avail. If properly carried out, according to the directions given below, the sufferings of the patient are actually but little, and the treatment goes on to a successful issue.

"The most useful combinations in my hands have been the compound cathartic pills of the pharmacopeia, which contain:—

	Gm. or c.c.	
℞ Extracti colocynthidis compositi	0.08	gr. j⅓.
Hydrargyri chloridi mitis	0.06	gr. j.
Cambogiæ	0.016	gr. ¼.
Resinæ jalapæ	0.02	gr. ⅓.

"And also the pilulæ catharticæ vegetabilis:—

	Gm. or c.c.	
℞ Extracti colocynthidis compositi	0.06	gr. j.
Extracti hyoscyami,		
Extracti jalapæ .....āā	0.03	gr. ss.
Extracti leptandræ,		
Extracti resinæ podophylli .....āā	0.015	gr. ¼.
Olei menthæ piperitæ	0.008	♏ ⅛.

"To these last I have added in each pill $\frac{1}{10}$ grain (6 mg.) of the oleoresin of capsicum, ½ grain (30 mg.) of ginger, and $\frac{1}{25}$ minim (0.0025 c.c.) of croton oil. I also found that the ordinary stock preparations of compound cathartic pills were too dry to be effective. I, therefore, had made up fresh masses of these preparations and the mass equivalent to each pill put into a capsule. The preparations kept their freshness and their ef-

fectiveness was very noticeably increased. I also had put in capsules blue mass in 5-grain doses. I have thus gone into details because of their importance.

"For brevity, I shall hereafter refer to the compound cathartic pills as C.C. pills, and the vegetable cathartic pills, as modified above, as B.B. pills.

"The treatment in a case of morphin or cocain is as follows: Before beginning the treatment, give four C.C. pills and 5 grains of blue mass. It is also wise at this time to give an enema of soapsuds to clean out the rectum and sigmoid, thoroughly. When these pills have begun to act, begin with the specific, 6 to 8 minims, and give it every hour throughout the treatment, or until some signs of belladonna intoxication are observed. Every six hours, increase the specific 2 minims until 14 or 16 minims are being taken every hour. Do not increase above 16 minims. If the signs of belladonna intoxication are noticed, such as dilated pupils, dryness of the throat, red rash, or a rapidity and incisiveness of speech, or sometimes a beginning delirium, stop the specific. When these belladonna symptoms have subsided begin the specific again in 8-minim doses. Some patients are very susceptible to belladonna and one may have to begin again with 4, 5, or 6 minims. Give with the first dose of the specific from one-half to two-thirds of the usual total daily dose of opium, morphin, or cocain which the patient is taking at the time of his treatment. Divide this amount of narcotic in three doses and give them at half-hour intervals by mouth or by hypodermic as the patient is accustomed to take it. After the first dose of the specific, wait fourteen hours and give four C.C. pills and 5 grains of blue mass; again, six hours later, repeat the four C.C. pills, or give four to six B.B. pills. It is essential that the cathartic should act at this time, and, if the above amounts do not produce the desired action within three or four hours, they must be repeated with 5 to 10 grains of blue mass. It is astonishing how difficult it sometimes is to obtain a cathartic action at this period, but

cathartics must be persisted in until a movement is obtained. If this is not done, the patients are liable to begin to vomit, and the distressing symptoms of the narcotic withdrawal will come out in full force. An ox-gall enema is sometimes of assistance.

"After the bowels have acted, but not before, one-third or one-half the original dose of the narcotic may be given. This will make the patient comfortable and contented and ready for the final stage.

"Twelve hours after the second dose of the narcotic again give four C.C. pills or four to six B.B. pills with 5 grains of blue mass, and six hours later give an ounce or more of castor-oil disguised in coffee or orange juice, but not in whiskey. Just before the castor-oil acts, one may have to give from 2 to 5 grains of codein phosphate hypodermically or by mouth to quiet the nervousness and discomfort. This is not always necessary, but it adds to the comfort of the patient and does not tie up the secretion as does opium or morphin. The castor-oil at this time will produce a characteristic stool, which shows that the entire treatment may cease. This is a liquid green stool, composed of mucus and bile. When this stool occurs, or shortly after, the patients often will feel suddenly relaxed and comfortable, and their previous discomfort ceases. The transition from discomfort to relaxation and contentment is often strikingly marked.

"After the patient has been under treatment for thirty hours one should begin to give some cardiac stimulant, such as strychnin, $\frac{1}{30}$ to $\frac{1}{60}$ grain every three hours, or digitalis, or strophanthus, either one of these separately or in combination. These tend to overcome the relaxation of the vascular system, which in these patients often produces a feeling of exhaustion.

"During the treatment the patients should be given a regular diet of easily digested foods, such as eggs, cereals, bread and butter, and vegetables; coffee or tea if they desire it. Many of these patients have a good appetite throughout and eat abundantly; some, of course, do not, and, beginning in a poor physical

condition, do not begin to eat abundantly until after the treatment is ended. After they are through the treatment, their appetite becomes voracious, and during the first week care must be taken that they do not overeat, which they are very prone to do. If their stomachs should become overloaded the discomfort will often make them feel as if they were suffering from the symptoms of withdrawal of their accustomed narcotic. If this occurs, the best thing to do is to give them an emetic, and their distressing symptoms will soon cease.

"In the above description of treatment for morphin, cocain, or alcohol, I have spoken as if the patient was taking a single drug. Very frequently we encounter patients who are taking morphin and cocain or morphin and alcohol. When this treatment is given to the cocain habitué who is taking only cocain, or when morphin and cocain are combined the patients sleep almost continuously throughout the treatment. Cocain is usually taken as a stimulant, an antidote against the depressing effects of the morphin, and this should never be forgotten; therefore, the initial dose of the morphin in the very beginning of the treatment, when the two drugs are combined, should be smaller than when morphin alone is taken. Cocain is so strong a stimulant that when it is withdrawn it is often necessary, from the very beginning of the treatment, to give a stimulant, such as strychnin, instead of waiting thirty hours, as stated above.

"The familiar symptoms in morphin withdrawal, such as intense diarrhea, intense joint and abdominal pains, and muscular contractions, do not occur when this treatment is properly carried out. They are most likely to appear just before the second cathartic acts, and for that reason, as emphasized above, the cathartic action must be obtained at this time. If this is not done, the patients are certain to have trouble.

"The accompanying table gives in abbreviated form the course of the treatment in a number of patients and gives a statistical view of the various types of patients and the duration

of their treatment. The duration of stay in the hospital may seem excessively long, but many patients remain in order that they might be built up physically after their treatment. Their craving for their drug ceased when the characteristic stool occurred.

"As is well known, morphin is often taken to smother the pain of some underlying disease, or the distress of some disturbance of function. If these causes still exist after the morphin has been eliminated, the evidence of this former disease, or this disturbed function will come to the surface again. At times the narcotic addiction is but a symptom of some abnormal mental state, which is only diagnosticated after the narcotic craving in the patient has been removed. This treatment is not a cure-all for disease, a rehabilitator of all the disturbed functions of the body, but if properly carried out it will obliterate the craving for the narcotic and the patient starts anew where he was before taking the narcotic.

"The details of this treatment have been given so minutely because it is necessary that they should be carried out, for the success of this treatment depends on the conscientious adherence to its many details. Unless the adherence is given this treatment will probably not succeed. A successful issue is endangered when an attempt is made to carry out the treatment in the patients' homes and in their accustomed environment. They must be placed where they are alone and where they can be carefully watched. Morphin habitués never begin a treatment with any confidence of its success, but invariably with a dread of the distressing withdrawal symptoms. They will secrete the drug in the most unexpected places, and they are the most sly and resourceful creatures on earth, especially those who have ever tried to break it off. No physician is capable of taking this treatment himself and carrying it through successfully. If it is attempted, the old medical adage that the doctor who treats himself has a fool for a patient will be strikingly exemplified.

"This treatment does not offer a cure of the perverted habits of the human race, or a regeneration of the mentally defective. It will obliterate the craving for narcotic drugs, and that is all that is claimed for it."

The table referred to in the above article gives the details of the treatment of 28 cases of narcotic addiction. Two of these were addicted to morphine and cocaine, 24 to morphine alone, 1 to heroin, and 1 to laudanum. In this series there were 17 males and 11 females; the average age was 36 years; the average duration of addiction was four and two-thirds years; the average daily dose was 9.6 grains of morphine; the average duration of the so-called "specific" medication was sixty hours; the average length of time from the last dose of the opiate to the last dose of the belladonna mixture was sixteen and one-half hours.

The average length of time spent in the hospital by each patient was eleven days. Four were discharged within the first week, 1 each on the fourth, fifth, sixth, and seventh day. Twenty-one were discharged during the second week, 2 each on the eighth, ninth, and tenth day, and 4 each on the eleventh, twelfth, and thirteenth day, and 3 on the fourteenth day. Of the remaining 3, 1 was discharged on the seventeenth day, 1 on the twenty-second day, and 1 on the twenty-sixth day. Both of the cases treated for morphine-cocaine habit were discharged on the eighth day.

AUTHOR'S COMMENT.

The members of the profession at large are practically without experience in the treatment and management of narcotic drug patients. The teachings of the authorities have not been based upon sound pathological

and physiological principles; therefore, members of the profession are not in position to read literature on that subject with the same critical discrimination with which they read literature on other medical subjects.

This state of affairs would naturally lead them to accept without question the teachings of anyone who is regarded as an authority on this subject, and this makes the teachings of such a one. when erroneous, extremely hurtful.

A careful reading of the writings of Lambert by one whose experience is such as to justify him in passing a critical judgment upon them reveals errors of such gravity that the author deems it his duty to call attention to some of them.

An unfortunate feature of Lambert's last-quoted article is that it appears to be based upon no definite understanding of what he sets out to treat, leaving it, indeed, in doubt as to whether he recognized any pathology whatever as being involved. We can only get light as to the doctor's views on this subject by reference to his other writings.

In his article in Osler's "Modern Medicine," he describes addiction as a vice and seems to follow the time-honored custom of regarding the pathology as *nil.* One reading his article of September, 1909, would almost be led to the conclusion that he had changed his views on that question, but that is evidently not the case, since in an article published in the *Journal of the American Medical Association,* February 18, 1911, he says: "Alcoholism is a social vice and not a secret one, as is morphinism."

Now, if, indeed, morphinism be a vice, no more, no less, we are at a loss to imagine how the doctor can regard his belladonna compound as a "specific" for

moral obliquity, or how he can connect the appearance of biliverdin in the stools with the disappearance of a vice. "Purge me with hyssop, etc.," is inspired scripture, but so far as we know it has yet to gain a reputation for saving grace in modern therapeutics, rationally applied.

So the doctor goes out with his belladonna "specific" and with his purgative compound to combat a vice and claims to the profession that he succeeds in dosing and purging the "very devil" out of his patients, but his system seems to be at conflict with itself, and he appears to be as uncertain as to which of the medicines he administers does the work as to what he is treating and why.

He evidently regards the "craving for the drug" as the principal element of the addiction and the one most difficult to be overcome by treatment. He brings his belladonna compound forward as a "specific" which obliterates this craving in a few days' time, yet he says, "This cathartic medication forms one of the crucial points in the treatment. Unless it is properly carried out, the treatment will fail and the patient suffer intensely and to no avail." The author would ask, Which is the real curative agent? The purgative or the "specific"? Why call a compound a "specific" when it will not cure?

The word "specific" when used in medicine and applied to a remedy has a well-defined, clean-cut meaning. It is only applied to remedies which of themselves and unaided have the power to effect a cure, such, for example, as mercury in syphilis, quinine in malaria. It is evident that the doctor's article is misleading on this point.

From the standpoint of a practical therapeutist, the teachings of this writer are open to far more serious objections than the one just mentioned.

Lambert well urges the necessity for free purgation, but the purgative compounds he recommends are extremely drastic and the extent to which they are administered places an unnecessary tax on the strength of the patient. Drug habitués, as a rule, are very anemic; their blood is thin; their tissues are poorly nourished; they have no strength to spare; therefore, in preparing them for the withdrawal of their drug, or in treating them subsequent to it, the most scrupulous care should be exercised to preserve their strength. While the administration of purgatives is essential in any effort to free the system of toxic matter, these should be selected and compounded so as to act in the most conservative manner, and to place the least tax on the resources of the system. No purgative compound which depends on reflex action to excite the motor function of the bowel, as do those recommended by Lambert, meets this requirement.

Lambert finds great difficulty in getting purgatives to act. This is true because, in drug habitués, the motor function of the bowel is more completely suspended than the secretory function of the glands.

In order to secure evacuation of the intestinal contents it is equally as necessary to stimulate the motor function of the bowel as the secretory function of the intestinal glands.

Notwithstanding this fundamental proposition, Lambert administers glandular stimulants and trusts to their irritating qualities, or to the irritating qualities of the secretion they induce, to excite peristalsis, the other essential condition to bowel movement. When the

nerve-centers are profoundly impressed with narcotics, as in the case of drug habitués, reflex action alone is not capable of exciting efficient peristalsis unless such reflex action is induced to an exaggerated degree. If glandular stimulants are given in such quantities and of such an irritating quality as to excite this exaggerated degree of reflex action, they cause much distress, colic, griping, nausea, etc., and when they do finally act they act with undue severity and exhaust the strength of the patient. On the other hand, if the motor function of the bowel is induced by direct stimulation of the motor centers, then much less of the glandular stimulant is required; it acts more promptly and efficiently and with much less tax on the resources of the patient.

There is no question but that the emunctories should be thoroughly aroused and free purgation obtained, but any course of treatment which involves the giving of purgatives equivalent to 30 or more compound cathartic pills in less than three days' time, as does the plan advocated by Lambert, is extremely drastic, and, in the author's opinion, involves an unnecessary waste of the patient's strength. Better results can be obtained with far more conservative measures.

Strychnine in sufficient quantities to overcome the semiparalyzed condition of the intestine and to excite active peristalsis, is an essential ingredient of any purgative compound intended to empty the intestinal canal of a drug habitué, if that is to be accomplished without undue waste of the patient's strength. The administration of glandular stimulants (chemical irritants) to a drug habitué in such large quantities as to bring about a degree of irritation, in the upper part of the intestinal canal, sufficient to excite efficient peristalsis by reflex action, is as unreasonable as the effects are unpleasant and exhausting.

With reference to the obliteration of the craving for the narcotic about which Lambert and others have expressed so much concern, the author wishes to say that the demand of the system of the drug habitué for his drug, his inclination to take it, his desire for repeated doses of his particular drug, springs from a physical condition and not from a mere appetite such as the word craving would ordinarily be understood to imply.

The habitual use of the drug brings about marked functional derangement of every organ in the body. The bowels are habitually constipated, the portal system is engorged, the heart is overworked, the motor function of the bowel is greatly impaired, the activity of all the secreting and excreting organs is diminished, the body is poorly nourished, and the entire system is saturated with the products of tissue disintegration; in fact, an intense toxemia exists. The nervous system is made to tolerate the presence of this toxic matter by keeping it constantly blunted by the effects of the narcotic.

The urgent demand for the repetition of the dose, the so-called craving, is due mainly to the effects of this toxic matter on the nervous system. If this toxic matter is removed from the system, and, just in proportion as it is done, the demand for the narcotic ceases, the so-called craving disappears, without the intervention or aid of any "specific" remedy.

That a remedy of the belladonna group does meet one of the indications in the treatment of narcotic cases is unquestionably true, as the author has shown in previous chapters of this work, but that it is the principal curative agent or even the chief factor in overcoming the so-called craving he denies.

It is easily capable of demonstration that the toxic matter in the system of the drug habitué is the source of

the demand for repeated doses of his drug; in fact, is the essential pathology of the addiction. When this pathology is overcome, when the system is freed from the toxic matter, the craving or demand for the drug disappears as soon as the secondary effects of the opiate are exhausted without further treatment of any kind.

As to the composition and mode of administration of Lambert's so-called "specific" the author wishes to say that the prickly ash in the quantities given in the dose of the "specific" has no perceptible effect on the patient; therefore, it had as well be left out. The effects of the other two remedies, belladonna and hyoscyamus, are practically the same, and either will do for the patient all that the two will do in combination, but if it is desired to combine them there can be no objection; however, since alkaloids of each of these remedies are obtainable, the author does not deem it in accord with the demands of rational therapeutics to depend upon the stomach administration of the Galenic preparations.

The strength of tinctures and fluidextracts found on the market varies greatly, sometimes as much as 100 per cent.; therefore, their use, because of this variability of strength, introduces an element of uncertainty which should not be allowed to enter into so important an undertaking.

Again, the stomach is often much disordered and the remedies are likely to be rejected by vomiting, but, even if they are not vomited, the mucous membrane of the stomach is so irritated, especially if purgative compounds such as are recommended by Lambert, containing colocynth, gamboge, podophyllin, and croton oil, are given, that the absorption of remedies is interfered with and may be delayed for hours at a time, during which the patient suffers unnecessarily, when he could have

been relieved promptly, by the very remedies which were being given, had they been administered hypodermically.

Not only may this disordered condition of the mucous membrane of the stomach delay the absorption of the remedies and cause the patient to suffer unnecessarily, but the absorption may be delayed until a number of doses have accumulated in the stomach, and then, when absorption does begin, all these may be taken up at once, with the result that the patient is brought more profoundly under the influence of the remedies than was intended, or than is desirable.

The author insists that these elements of uncertainty should not be allowed to enter into an undertaking of this kind, especially since it can be so easily avoided by the hypodermic administration of the active principles of these remedies. All unnecessary suffering should be avoided. Suffering impairs the vital forces and renders recovery less certain.

It will be noticed by reference to the abstract of the tabulated report of the 28 cases recorded by Lambert that 25 of the patients were discharged from the hospital within two weeks from the beginning of the treatment. The article would lead anyone to believe that they were cured of their addiction and in condition to think and act for themselves and to fully regain their health without further treatment or supervision from anyone. The author's experience will not allow him to believe that. He feels quite sure that all of the four who were discharged during the first week returned to the use of some stimulant within three days from the time they left the hospital, and it is more than likely that the same is true of a majority of those who were discharged during the second week.

No matter how perfectly the system of the patient may be cleansed from toxic matter and how completely

the "craving" may be "obliterated," it is extremely rare that a patient of this class can be brought to such a condition as to be safely trusted to think and act for himself within ten days from the beginning of the treatment. Time, as well as treatment, is an essential factor in restoring them to self-control, and they should not be left to their own volition until they have so completely regained their footing as not only to make it "possible" for them to refrain from taking a drug, but to make it certain that they will do so.

The profession expects better things of men engaged in the treatment of narcotic drug cases than for them to merely take such patients, give them a few days' "specific" treatment, keep them a few days longer, and then discharge them as cured, when, in fact, they have not in any wise regained a normal condition. Four weeks from the beginning of treatment is quite early enough under the most favorable circumstances for any drug patient to be thrown on his own resources, and it would be far better if he could be under the personal supervision of his physician for three months.

Recapitulation.

In recapitulation, the author's objection to the teachings of Lambert may be stated as follows:—

Absence of definite statement as to the pathology of condition considered.

Erroneously classifying the same as vice.

Overestimation of the importance of the so-called craving.

So-called "specific" not a specific.

Failure to provide for physiological stimulation of the motor function of the bowel, an essential to bowel movement.

The excessive use of secretory stimulants of an unnecessarily drastic type.

Subjecting the patient to uncertainty of relief from suffering, and to the overeffects of the remedies, by reason of the varying strength of the Galenic preparations and of the disordered condition of the stomach.

At least 25 of the 28 patients reported in the series of Lambert were discharged from the hospital too early to be considered cured.

CHAPTER XXII.

THE COCAINE HABIT.

It will be noticed that the author here uses the word "habit," instead of disease. This is done advisedly; that is to say, the word "habit," as commonly understood, can be properly applied to the habitual use of cocaine, but it should not be used to signify the conditions growing out of the prolonged use of opiates.

There is a wide difference between the morphine disease, and the cocaine habit. The morphine disease may be acquired justifiably; that is, because of the legitimate use of morphine for relief of pain, or, inadvertently, by using it for support during excessively long working hours, or by one taking it in some remedy not known to contain it, or it may be taken up as a pure dissipation, but, no matter how its use is begun, when the addiction is fully established, it is a disease and the victim is helpless and cannot abandon the use of the drug or cure the disease by merely exercising his own volition. He is in the toils of a monster with whom he is unable to cope, but this is not true of the cocaine habit.

The use of cocaine is usually taken up by those already addicted to morphine. In the course of two or three years from the beginning of the use of morphine it ceases to exert a distinctly stimulating effect on the user. There is little, if any, pleasurable sensation from its use. It is continued because its disuse entails suffering which the victim is unable to bear.

Morphine users who are inclined to dissipate, after reaching this stage, frequently add cocaine for the stimulating and pleasurable sensations produced by it, they

not being satisfied with the effects of the morphine alone. This is begun and continued as a pure dissipation. It could be abandoned any day without material suffering by merely dropping the cocaine and continuing the morphine.

There is no more difficulty in sobering a man up from a cocaine spree, or from the habitual use of it, than in sobering him up after a temporary alcoholic indulgence; neither is there greater suffering incident to it. The habitual use of cocaine does not bring on a disease in any way comparable to that of morphine. One is taken up and continued purely as a dissipation; the other is a calamity, and so enslaves the user that he cannot abandon it of his own volition.

Cocaine is seldom used alone habitually. Its use in the Southern sections of the United States is confined almost entirely to the negro race, and the negroes use it intermittently. The power of cocaine to sustain one under a prolonged strain is well understood by the laboring class of negroes. Frequently those engaged in unloading and loading steamers will work forty-eight to sixty hours, continuously, by supporting themselves with cocaine. When the ship is loaded, then they go to their quarters and sleep two or three days before even rising to take food. In this time they have slept off the effects of the cocaine and are comparatively normal. Then no more is taken until another strain comes upon them and in this they again sustain themselves with the drug.

Others who take cocaine as a dissipation use it through the night, or probably through a day and night, and then abandon it for a time and later go on another spree. This is cheaper to them than alcoholic intoxication and is said to be much more delightful.

Persons who take cocaine alone are dangerous, both to themselves and others. Cocaine produces delusions of

persecutions, and, acting under one of these delusions, one under the influence of cocaine is liable at any time to do violence to anyone near him, not that he would have any ill will toward the particular person; but believing that he is being pursued by some enemy, which is merely a phantom, he is liable at any time to turn and use a pistol or other weapon on such imaginary enemy, and an innocent party be maimed or killed. It is never safe to allow such a person to remain at liberty.

The most insidious and damaging manner in which cocaine is reaching our people, that is, the white people of this country, is through the carbonated drinks for which many have such a passion. It is in the manufacture of such drinks that the bulk of cocaine is used. The great increase in the importation of cocaine leaves is not due to the demand for cocaine as a medicine, or from its personal use by drug habitués, but it is because of the demand for the leaves as the one essential ingredient in establishing and perpetuating the use of these carbonated drinks.

Many of these drinks, some having a name very suggestive of this damaging, yet fascinating drug, have been skillfully and persistently advertised; but their use and the hold they have upon the public do not depend upon this skillful use of printers' ink, but upon the fact that the *effect of one drink creates a demand for another.*

These drinks are advertised to relieve headache, overcome fatigue, and impart in its stead a sense of exhilaration and well-being, and they do this, but not by removing the cause of such conditions, nor by supplying the system with the physiological activity and the energy which are the counterpart of these unwelcome conditions; they do it by blunting the sensibilities, for a time, to their existence.

As the effects of the stimulant in the drink dies out the demand for another drink is strongly felt, and then a second drink is taken, and this is repeated several times a day. We have, as a result, thousands of young men and women depending upon the energy derived from these drinks to enable them to carry on their work. Many of them taking from three to a dozen or more of these medicated soda-fountain drinks each day. They will tell you that they feel totally unable to undertake their day's work without their "coke."

They are, in fact, as really enslaved by the drugs these drinks contain as they would be were they using them in other form. It is to their enslaving properties that these drinks owe much of their enormous and continuous sale. Doubtless, when the facts are ascertained as to the use of cocaine by the school children of Philadelphia, which has recently created such an uproar, it will be found to have had its origin in the medicated soda-fountain drinks rather than from the seductive influence of older persons used in a more direct manner.

Children who are allowed to become soda-fountain fiends acquire a taint that, when opportunity presents, leads them to take to cocaine or other stimulants like a duck to water.

TREATMENT.

Much misconception exists as to the nature and treatment of the cocaine habit. When cocaine is taken alone the treatment consists simply in cleaning out the system by an active cathartic, shutting off the cocaine, and allowing the patient to go to sleep. If the patient has been taking a considerable quantity of cocaine this sleep will continue for some eighteen to thirty-six hours, but it should not be interrupted.

When anyone is taking cocaine the system is kept constantly saturated with it by repeated doses. The effect of this drug is to keep the patient excited, in a wakeful state, and this will continue as long as the doses are regularly repeated, even if that be for forty-eight hours continuously without sleep. Most cocaine users sleep very late of mornings, but before they are able to rise from bed and dress themselves they must have one or more injections of their drug. This puts them on their feet and then they continue to take their doses at short intervals from that time until late the next night, or they may run even a day and night in succession before they stop their dosing again to such a degree as to give themselves a chance to sleep.

But usually they will begin their day's dosing about 10 to 12 o'clock and run until 2 or 3 the next morning, and then leave off their doses; then they soon become drowsy and go to sleep. When once asleep they will sleep so heavily that the sleep will be continued until nature has sufficiently restored the system to enable them to arise again. As soon as they awake, their day's work, which consists in repeatedly dosing themselves or injecting cocaine, again begins and nothing else is done. In fact, they are totally unfit for application to business of any kind.

If cocaine is taken in connection with morphine the condition is not quite so bad, but few people who take cocaine will do anything at all in the way of attention to business. After they get to taking cocaine in considerable quantities it requires all their time to keep the effects of that drug balanced with the morphine they are taking.

In treating such a case a thorough course of elimination should be given so that the medicine will act early

in the morning. Their cocaine should be given to them up to 10 or 12 o'clock at night and then taken away. Within two or three hours after the last dose of cocaine the patient will go to sleep and sleep heavily until he is aroused, or until the cocaine effect has entirely worn away.

By having the purgative ready to act, that is, by giving the purgative so it will be ready to act as soon as the patient awakens, the evacuation of this toxic matter relieves the nervous system to a considerable extent, and this usually quiets the patient so that he can tolerate his existence without the cocaine.

A few free evacuations of the bowels give sufficient relief to enable him to go back to sleep and then twelve or eighteen hours more of sleep brings him to a condition of comparative quietude, in which no further real demand for the effects of cocaine exists.

Cocaine should be discontinued at bedtime on the first day of treatment and none of it given thereafter. It is true the patient will be nervous for a few hours, even after his prolonged sleep has passed, but any simple sedative will overcome this to such a degree as to enable him to bear it and within a day or two the nervousness disappears to such a degree that further medication is not necessary.

There is no severe suffering; neither is there danger in withdrawing cocaine abruptly from the patient after the portal system has been disengorged and the bowel emptied. There is no reason whatever for a partial cutting off of the drug or for the reduction of the dose before it is abruptly stopped.

This immediate withdrawal is not followed by a collapse or any other of the dangerous complications incident to the withdrawal of opiates, but it should not be

practised until the portal system is disengorged, the bowel thoroughly cleared, and the heart relieved of the burden against which it would be called upon to work were these organs left in the contaminated, engorged state.

If the patient is taking cocaine and morphine together, then the treatment for the morphine disease may go hand in hand with the treatment for the cocaine habit. The author finds it much better to withdraw both drugs at once, so far as the physical condition of the patient is concerned, than otherwise, but that does not hold good when the prognosis is considered. Patients after they are taken off of cocaine usually sleep even more than a normal person, and this, to a large extent, compensates for the absence of sleep due to the withdrawal of morphine. In many cases in which the author has withdrawn morphine and cocaine at the same time, the patient has slept more than a normal person would have slept during the first two or three weeks after such withdrawal. This is a very delightful experience to them.

PROGNOSIS.

The prognosis in the cocaine habit is usually unfavorable. Very few indeed of those who have formed the cocaine habit will give it up and remain free from it. That is, very few of them will remain free if both the morphine and cocaine are taken away at once.

The author for a number of years has pursued a different plan and one which is giving good results. So far as the physical condition is concerned, there is no reason why the cocaine should be taken away before the opiate, but when the prognosis is considered there is a reason why the cocaine should be first discontinued.

The use of cocaine is usually begun as a dissipation. The effect of the cocaine has most likely increased the

tendency to dissipate rather than otherwise, but in some cases, in fact in many cases, the individual still retains sufficient reason to realize the damaging effects of the use of these drugs combined. When that is true and the patient can be led to abandon the cocaine and live as much as twelve months, taking morphine alone, the probability of his remaining free from both drugs is very much better than if both drugs are withdrawn at once.

The author now insists that a man who is using cocaine and morphine is not in condition for treatment with the expectation of his cure being at all permanent, unless he is taken off of cocaine and then required to continue the use of morphine, under the observation of some competent medical man, for a period of twelve months. If the individual has enough self-control left, and has determination sufficient to discipline himself into doing without the cocaine, this will fit him for treatment.

After a year of this kind of drilling and probation, he can be taken off the morphine and the results will almost certainly be a permanent cure; but if he be taken off the cocaine and morphine at once, the mental impressions left by the cocaine will so haunt him that the chances are very much in favor of his returning to either or both of the drugs in a very short time. The author prefers not to take cases of cocaine habit, unless they place themselves under his care for a period of twelve months and are willing to pursue the course above outlined.

Cocaine has an intensely fascinating effect, one that is extremely seductive to those who have been habituated to its use. It overcomes all sense of discomfort, of unhappiness, and brings about a state of satisfaction with the conditions that exist that is most delightful to many persons. When a person has been addicted to morphine or other narcotic drug and has gotten to the "down

and out" stage, the effects of cocaine appeal to him very strongly. It brings him surcease from all of his sorrows, and the fascination created on his mind is such as to dominate him, and it is a rare thing that he can be led to give it up.

But if he still retains that degree of self-control that will enable him to give up the cocaine and continue the use of morphine in uniform and moderate quantities for as much as twelve months, he still retains sufficient self-control and moral purpose to make a good and successful fight against the morphine disease. Persons who will faithfully carry out this disciplinary course are developed into a condition favorable for treatment.

Cocaine was once lauded as a cure for the "morphine habit" and many began its use with this idea, only to find themselves enslaved by two drugs. The use of cocaine as a nasal spray is another source from which its abuse has sprung in a few cases. The author has had several cases of this type who use the drug in no other way, but were continually spraying their nose and mucous surfaces with cocaine. These, evidently, obtained but little systemic effect from the cocaine, but if the author's information is correct all but one of them resumed the use of the spray after treatment.

Keibler, in the U. S. Dept. of Agriculture, is quoted as saying: "Cocaine is fast taking the place of morphine." The author cannot understand such a statement coming from one having knowledge of the effects of the two drugs. These effects are not at all similar and cannot be made to take the place one of the other; in fact, their effects are so different that cocaine is recognized as one of the antidotes in morphine poison. About 10 per cent. of morphinists use cocaine with their morphine.

CHAPTER XXIII.

CHRONIC ALCOHOLISM

UNTIL the last quarter of a century, alcoholism was almost universally regarded as a mere moral perversion, a bad habit entered into and continued because of moral degeneracy. Numerous efforts were made to reclaim and reform the drunkard. Almost all of these consisted in an appeal to the moral and emotional nature of drinking men and many were thus influenced to abandon the use of alcohol, but a large majority were unreached by these efforts.

In more recent years the wretched condition of these men has appealed strongly to scientific men who were students of human nature as well as of abstract science, and the causes or influences which led such men to enter upon and continue the use of alcoholic beverages have been studied from every viewpoint. These studies have fully established the fact that only in a very small percentage of cases is alcoholism a mere moral perversion, but that it is in the truest sense a disease, a disease having a well-defined and demonstrable pathology.

Since the disease theory of chronic alcoholism has been accepted, the question has naturally arisen: What can be done by treatment for this disease? Is it curable? To this last question both an affirmative and a negative answer can be made and each will be correct when applied to a certain class of cases.

Chronic alcoholism is not only a disease itself, but in many instances it springs from other diseases and it is certain that other diseases grow out of it. These diseases may be either physical, mental, or moral. To cure

any disease the cause must be removed. In some cases of alcoholism this can be done by treatment; in others, it cannot; hence the question naturally arises: What class of cases is curable and what is not?

In endeavoring to answer this question, it is necessary to consider the type of the addiction as well as the influences which led to its formation. For the purpose of study, as well as for treatment, it is best to divide alcoholic subjects into two general classes, regular drinkers and periodic drinkers.

There is wide difference between the influences which lead the periodic alcoholic to go on a spree and those which prompt the regular drinker to continue the use of his beverage.

REGULAR DRINKERS.

Probably 80 per cent. of all persons who habitually drink alcoholic beverages form the habit inadvertently, unintentionally, and without any definite purpose in view. Among them may be found persons of the highest aims who, primarily, had sound bodies and minds and good habits, but who began the use of alcoholic beverages in a social way or with the erroneous idea that the effects of the alcohol would protect them from some prevalent disease, such as malaria, etc.

Such persons continue the use of alcoholic drinks without mature thought as to their effects on them and certainly without any purpose to go to excess or to dissipate in any way; but no matter how begun, the frequent use of even a small quantity of alcohol creates a demand for increasing quantities, and this grows by almost imperceptible degrees until there is a daily consumption of considerable quantities of some alcoholic drink.

For a time the effects of this beverage seem to improve the health, to impart greater mental and physical vigor and generally to promote the well-being of the subject, but these benefits are more apparent than real. In fact, they are not real at all, the effects of this agent having merely built up a state of apparent hypernutrition by increasing fatty metabolism and decreasing waste.

In this manner an unwholesome bodily state is brought about in which the demand for the effects of alcohol is increasingly felt, and because of which the victim is only comfortable when under the influence of alcohol. Almost imperceptibly the demand for stimulants grows, the victim becomes more and more dependent on them, and larger and larger quantities are required to meet the demand.

The daily consumption of these considerable quantities of alcohol necessarily brings about such changes in the system as to create an imperative demand for their continuation.

After reaching this stage, the victim feels that he cannot begin his day's work without his morning drink; there is a degree of lassitude, a lack of vigor which he seems totally unable to throw off without the aid of his stimulant. As the disorders growing out of the use of alcohol progress, one drink is not sufficient to give the desired support; then two, three, or more are taken in close succession, and this bracing process is continued throughout the day, from day to day, and from week to week.

The effects of this prolonged and free use of alcohol bring serious impairment of the digestive organs, the appetite is variable or absent altogether unless freshly stimulated by an extra drink, and if, at this or any subsequent stage, the victim makes an effort to discontinue

drinking such a state of nervousness arises as to drive him to resume the stimulant.

The entire system has by this time become so saturated with toxic matter that a condition of intolerable nervousness arises whenever the system is allowed to get from under the now-sedative effects of alcohol, and, no matter how acutely conscious of his slavery the victim may have become or how heroically he may struggle to throw off the yoke, he finds himself unable to do so by his own efforts.

The prolonged free use of alcohol brings on such disorders of the system as to lead the best of men, when in its grasp, to continue to seek relief from these disorders by increasing the quantity of alcohol consumed. Whether that course is imperatively necessary or not, it appeals to them as being the one readily available remedy, the panacea for every ill, and it is so used.

A majority of habitual users of alcohol in this country belong to this class, and many of them would gladly quit drinking if they could ever get the poison out of their systems and reach a state in which they could live in comfort without it, but they seem never to be able to do so. They never become entirely sober and their systems are never normally free from the products of tissue waste; on the contrary, they are habitually in an extremely toxic condition and are comfortable only when the paralyzing effects of alcohol blunts their sensibilities to the irritating effects of this poison.

In habitués of this class, the addiction has a purely physical basis which is the product of alcohol alone. This consists of both structural lesions and functional derangements, but the structural lesions have little influence toward impelling the victim to continue the use of alcoholic drinks.

The functional derangements are usually the only disorders growing out of the use of alcohol of which he is conscious, but these throw him into extreme distress when he attempts to go without the aid alcohol gives him. These functional derangements consist mainly of a chronic catarrh of the stomach, accompanied by an intensely toxic condition of the system, but, as these yield readily to proper treatment, alcoholic patients of this class are curable.

It is folly to talk to a man in such condition as this about reforming his life and stopping the use of stimulants by his own efforts. The forces which impel him to continue the use of alcohol are stronger than any will-power he is able to exert. In order to put him in condition so that his own will, his normal impulses, may control him, his system must be thoroughly renovated and the physical demand for the effects of alcohol removed; then his moral nature can assert itself, and then, and then only, can he control himself by the exercise of his will power.

In the second class of regular drinkers the author would place a small percentage of persons who were born with, or who from disease in early life acquired, a defective physique and an unbalanced nervous system, persons who because of such defects have never been normal either in nervous system or physical organization. When such persons, in seeking something to overcome their habitual discomfort, experience the effects of alcohol they readily fall victims to its seductive influences. For a time it seems to fill the vacant place and to be the one thing lacking in their lives; it overcomes that discordant nervous condition which they so much dread, and they feel that they have found a panacea for all their ills, but this relief is of short duration.

The demand for the effects of alcohol grows very rapidly in such persons, and its continued use brings on the same pathological changes that it does in others. The system soon becomes extremely toxic. This irritating matter greatly aggravates their former nervousness, so that the two conditions together now make such an imperative demand for the effects of alcohol that the victim cannot resist it and he keeps himself constantly saturated with alcohol; in fact, after reaching this stage, he must do so to enjoy the least degree of comfort.

But little can be expected from treatment in this class of cases unless it is found that the original discordant nervous element can also be removed by treatment. When it is found that these causative conditions are such as to be amenable to treatment, and the treatment for the addiction embraces not only such treatment as would be necessary to give relief in an ordinary case, but also such other measures as may be required to restore the primarily unbalanced nervous system to a normal condition, much benefit may be derived from treatment even in these unpromising cases, provided a reasonable degree of moral fiber was originally present.

In a third class the author would place another, relatively small proportion of regular drinkers. To this class belong those who drink as a pure dissipation, persons who are deficient in moral fiber, lacking in purpose, supremely selfish, willing to gratify the desires of the present moment at any cost to themselves or others; those who are simply drifting through the world without a rudder, compass, or objective port.

These defective traits of character may be due either to inherited tendencies or to early environment. Persons of this class drink because they prefer to do so, and they would return to the use of alcoholic drinks even if some-

one took them up and gave their system a thorough renovating and removed all physical necessity for the effects of such drinks.

In cases of this class more than human agency would be necessary to effect a cure. Not only would it be necessary to renovate their bodies and put them in normal physical condition, but it would be necessary to effect a most radical change in their moral nature, a complete transformation of their purposes in life, and nothing short of the grace of God is sufficient for such a work. Human agency will not avail.

Fortunately, only a small proportion of the regular drinkers belong to either of the two classes last mentioned; the great majority are of the class first described in this chapter. They are men of good families, of excellent traits of character, of high aims, chivalrous, generous to a fault, truthful, and honest; in fact, most of them are men with whom no fault can be found, except this one weakness, and that due to the fact that they have fallen into the clutches of this monster.

Victims of this class continue to drink only because their will-power and self-control and their ability to estimate correctly their own condition have been so undermined by the effects of alcohol that they cannot extricate themselves from its clutches, they cannot of themselves retrace their steps. On arising in the morning, they find themselves totally unable to begin their day's work without the bracing effects of alcohol, and because of the urgency of this physical demand they continue to seek what relief they can get from it from day to day.

When such men as these are freed from the domination of alcohol; when the physical demand for it is overcome and they are put in a normal condition, they almost

invariably remain permanently free from it. Failure to benefit permanently such men as are described in the second and third divisions above mentioned should not be allowed to discourage us or to render us less enthusiastic in our efforts to rescue the more numerous and really noble army of enslaved ones.

PERIODIC ALCOHOLISM.

There is a wide difference between the influences which lead to periodic alcoholic sprees and those which lead the regular drinker to continue the use of his beverage. Periodic alcoholism may spring from a variety of causes, but these may be studied to advantage under four types, which may be enumerated as follows: (1) dipsomania, real or symptomatic; (2) moral cowardice; (3) bad environment, with lack of stability of character, and (4) bad environment, with an ever-present, but usually successfully resisted, appetite for liquors.

DIPSOMANIA.

Dipsomania is defined to be "an uncontrollable desire for strong drink," but this term should be restricted to those cases in which this desire or impulse springs from a real mental disorder, a true mania. It should not be applied to cases in which the desire for drink only becomes uncontrollable when it is excited or intensified by some general physical derangement, or to cases in which the desire is continuous. A better definition would be: periodic insanity taking the form of an uncontrollable desire for strong drink.

Real dipsomania is very rare, but that it does exist cannot be denied. Most writers leave the impression that such attacks are due entirely to some obscure structural brain lesion or inherited mental defect. It is

doubtless true that there are persons in whom a real mania of this type occurs because of an inherited mental bias or perverted nervous organization, independently of the general physical condition, but, in the author's judgment, such cases are extremely rare.

In a large majority of cases which are thus classified, the attack occurs only when excited by an added systemic derangement, such as an acute intestinal toxemia. The irritating effect of this toxic matter serves as an exciting cause of an outbreak. In many instances these attacks may be warded off or prevented altogether by keeping the system free from toxic matter.

Where outbreaks of this kind occur solely as the result of an inherited mental defect, treatment cannot be expected to be of material benefit; but in cases in which such attacks occur only when an exciting cause, such as an acute toxemia, contributes its influence, then treatment can be a material benefit, provided it embraces such instructions in the manner of living as to enable the victim to avoid the occurrence of these toxic states.

MORAL COWARDICE.

Another and probably the most hopeless class of periodic drinkers are those who drink as an expression of moral cowardice. These are men who have no particular craving or appetite for liquors, who will say at almost any time that they do not care for the taste or primary effects of alcoholic drinks, but who have learned from experience that alcohol will blunt their sensibilities and bring them surcease from cares and worries which they have not the manhood and moral courage to take up and bear, and from time to time they seek forgetfulness in the effects of alcohol.

A man of this class will quarrel with his wife or a friend and go off and get drunk for spite, or he may

have some adverse business experience which to others would be trivial, but he, not having the moral courage to face it, runs from it and seeks oblivion in the effects of alcohol.

Little, if any, good can come from treatment in patients of this class. Therapeutic measures cannot remove from their lives these defective traits of character or impart to them that degree of moral courage which is needed to fit them to fight the battles of life in the open and resist the adverse currents which drift them from a safe and sober mooring.

INSTABILITY OF CHARACTER WITH BAD ENVIRONMENT.

In another class of periodic drinkers the sprees are due to bad environment coupled with instability of character. These are the social drinkers who lose control of themselves as soon as one drink is taken. Many of these are men of estimable qualities, amiable, chivalrous, good-hearted, kind, and in every way lovable men, but they are deficient in self-control, fixed purposes, and positive traits of character.

They are good-natured fellows who drift with the current and allow others to dictate their course. These men, when away from their drinking associates and out of temptation, remain entirely sober and would not think of going alone and deliberately beginning to drink; they have no craving or appetite for liquor which they are not fully able to control, but they are negative characters and when thrown with drinking associates they do as others do. They are of the type of social drinkers who lose control of themselves as soon as they are slightly under the influence of liquor. When once started, such men continue to drink until someone takes control of them

and assists them to get out of the adverse currents. Then a period of entire sobriety follows, only to end in another spree when they again come under these unwholesome influences.

Treatment in such cases can be successful only when followed by an entire change of environment. Not only must the old associates be given up, but the one seeking to reform his life must be thrown with sober and moral people whose positive influence for good over him will be sufficient to enable him to stand firmly in his new position notwithstanding his defective traits of character.

BAD ENVIRONMENT WITH AN EVER-PRESENT, BUT RESISTED APPETITE.

Another type of periodic drinkers are those who have an inherited or acquired thirst or craving which is ever present with them, but who, from strong convictions, contend against this weakness with a courage that in many cases is really heroic, and under favorable circumstances they succeed in controlling themselves, but when thrown with drinking associates, or when brought under other strong temptation, they find themselves unable to resist both the ever-present thirst and the temptation.

Under these circumstances they begin to drink, and as soon as one drink is taken their resisting power is gone, and they throw themselves into the spree with a vigor and abandon which is not known to the more timid or less resolute. They continue to drink until the stomach rebels and will no longer retain the liquor; then they go through a period of extreme distress and remorse, and finally get back on their feet.

Periodic drinkers of this type are more amenable to treatment than any other form of periodic drinkers,

because the craving, the thirst against which they contend, can be overcome; in fact, entirely destroyed. In addition to this, their attitude toward liquor can be so changed as to render its taste, smell, and effects repulsive to them. When men of this type are given this much aid, they find themselves quite able to contend successfully against the influence of drinking associates and to resist other currents of influence which, when associated with their former craving, would have been sufficient to cause them to fall.

PRINCIPLES OF TREATMENT.

Before undertaking to treat any disease, we should endeavor to ascertain the nature of the condition to be met; whether such a condition has a real, structural pathology or is only a functional derangement, and whether it is a physical or a mental disorder. That the prolonged use of alcoholic drinks does cause serious structural lesions of the brain, liver, stomach, and other organs cannot be denied, but such lesions are not the only or even the principal reason for the continuation of the habit.

In some cases, as we have seen in the preceding, the use of liquors is continued from preference, or because of some mental or moral defect, but in the great majority of cases alcoholic drinks are continued because of a strong demand in the system for their effects.

The habit has a real physical basis. This demand for the effects of alcohol is due mainly to the toxic condition of the system. Alcohol blunts the sensibilities of the nervous system and retards the excretion of the products of waste. The life of the human organism is a continuous process of waste and repair.

When the excretion of this waste is retarded, even to a slight degree, day by day, the system finally becomes

so saturated with poisonous matter as to cause serious functional derangement of every organ in the body.

One in this condition finds it necessary to keep the nervous system constantly blunted with the effects of alcohol or other narcotic in order to obtain a reasonable degree of comfort. While it is true that alcohol has caused these disorders, still its effects relieve the acute distress springing from them more promptly and in a manner more acceptable to the sufferer than anything else with which he is familiar; therefore, he continues to seek what comfort he can get by taking more alcohol, and thereby burns the taper at both ends.

In endeavoring to bring about such a change in this condition as to render the further use of alcohol unnecessary, the first and most important step is thoroughly to cleanse the system from the products of waste which the effects of alcohol have forced it to retain. In doing this the bowels, kidneys, and skin should all be made to do their full share; in fact, for a time these should be made to do many times their ordinary duty.

Just in proportion as the excess of toxic matter is eliminated will the nervous system become quiet and the urgent demand for the effects of alcohol disappear. As a rule, in the course of three or four days the system can be so cleansed of toxic matter as to permit the withdrawal of alcohol without risk or discomfort to the patient.

The author does not consider it safe, or at all advisable, to withdraw alcoholic liquors abruptly from one who has been using them in large quantities without first preparing the system for such withdrawal. After the system is properly prepared for the withdrawal, it can be made with safety and without discomfort, but we cannot agree with the arbitrary rule of cutting off the alcohol as soon as the patient is taken in hand.

Up to this point, the treatment in the several classes of alcoholic cases is practically the same, as all of them require elimination of the toxic matter and the withdrawal of alcohol, but, from this point on, the several classes will require radically different lines of treatment.

The particular nature of the treatment required to complete the cure will depend on the cause, or set of causes, which originally led to the formation of the habit, as well as those which have had an influence in its continuation. If these were purely mental, then treatment calculated to overcome a mental disorder should be given; if they were moral or social, then these influences should be looked into and every effort made to direct the patient's future life so as to protect him from these damaging influences and prevent a return to his old haunts and habits.

If the patient belongs to the more promising class, the regular drinkers in whom the habit was continued because of the usual mental bias favorable to the use of alcohol, and because of the deranged physical condition resulting from its effects, then the succeeding steps in the treatment should be to neutralize or eliminate the remnant of alcohol remaining in the blood, to overcome any appetite which may remain for it, and to supplant the mental bias favorable to alcohol with a dislike or complete disgust both for its taste and effect.

In cleansing the system from toxic matter cathartics are, of course, our most valuable agents, but to get the best results from cathartics it is well to combine podophyllin with the other ingredients. It has a more prolonged action than the other purgative ingredients, and alcoholic patients not only need its effect, but stand podophyllin well. The following formula is one which the author has used to good advantage:—

℞ Calomel,
Powdered extract of cascara.....āā gr. x.
Podophyllin ..... gr. j.
Strychnine nitrate ..... gr. 1/10.
Atropine sulphate ..... gr. 1/50.

Mix and make 4 capsules; write, one every two hours on an empty stomach.

In this formula each dose contains 2½ grains of calomel, 2½ grains of cascara, ¼ grain of podophyllin, 1/40 grain of strychnine, and 1/200 grain of atropine, differing from the one used in drug patients by the addition of the podophyllin, which remedy drug patients do not stand well and by the reduction of the strychnine from 1/20 to 1/40 grain for each dose. Alcoholics do not require as much strychnine to stimulate active peristalsis as do drug patients; neither do they stand strychnine so well as drug patients do.

One course of purgative medicine will do much toward cleansing the system of an alcoholic and relieving the urgent demands for alcoholic drinks, but it does not fully accomplish that result. It is best to follow this course with salts or oil in ten or twelve hours after the last capsule is taken. If these act freely it is then best to give the patient nourishment and allow a full day's rest from purgatives. The alcohol should be reduced in quantity, but not withdrawn altogether until further advance is made in the treatment.

Forty-eight hours from the time of giving the first purgative course another of the same character should be given and this followed by oil or salts, as before. These two courses will usually cleanse the system to such a degree as to permit the discontinuance of alcoholic drinks, and this should be done as soon after the second

purgative course as the condition of the patient will allow, but, if he is still very nervous or is threatened with delirium tremens, alcoholic drinks should be continued in reduced quantities, and these should be gradually reduced until discontinued.

The patient should be urged to drink as much water as possible and a vapor bath each day will also aid materially in cleansing the patient's system and overcoming his nervousness.

The author does not think electricity in any form has much, if any, value in these cases. Hydrotherapeutic measures, however, are of the greatest value and should be freely and persistently used.

For the relief of nervousness and insomnia, which are often due to cerebral hyperemia, the author has found gelsemium a remedy of the greatest value. Three to 5 minims of the specific tincture of gelsemium every two to four hours by the mouth, or $\frac{1}{25}$ grain gelseminine hypodermically at the same intervals, adds greatly to the comfort of the patient and diminishes the liability to delirium tremens.

It is the author's rule to keep the patient well under the influence of gelsemium during the first week of treatment. It is a cerebral sedative, a motor depressant, and overcomes the distressing nervousness of the patient to such a degree that the alcohol may be withdrawn more promptly and with much less distress.

After the patient's system has been cleansed of toxic matter, alcohol withdrawn, and all danger of delirium tremens has passed, then strychnine nitrate, $\frac{1}{20}$ grain from three to five times per day, hypodermically, will do much to overcome the appetite or desire for alcoholic drinks. This should be supplemented by a mixture to be given by the mouth, containing atropine, hydrastin,

capsicum, and some bitter tonic, and this mixture can be continued with profit for two or three weeks.

The author has found the following formula to answer the purpose well:—

℞ Atropine sulphate ..... gr. $\frac{1}{125}$.
Hydrastin, yellow alkaloid ..... gr. $\frac{1}{10}$.
Tincture of capsicum ..... ♏v.
Quinine muriate ..... gr. j.
Water ..... ℥j.

Mix and make one dose; give a dose similar to this three times a day.

After this has been kept up for about two weeks, both this and the strychnine should be discontinued and the patient put on ichthyol, which he should continue to take for about a month.

The catarrhal condition of the stomach is the remaining disorder which would exert the greatest influence toward a return to the old habit, because of its effects in impairing digestion.

Fortunately, catarrh of the stomach yields readily to treatment in these cases after alcohol has been discontinued, but active treatment for this disorder is essential, and it should be continued until all trace of it has disappeared and the patient's digestion is perfect. He should be able to eat and enjoy three good meals a day.

Patients of this class need the strength derived from a hearty breakfast to take the place of the support they formerly received, or thought they received, from the alcoholic drinks. No part of the treatment is of greater importance than this, since, if it is not successfully carried out, the patient will not be so secure from relapse as he should be. Impaired digestion, with its attendant lack of strength, operates as an ever-present influence

suggesting the need of some stimulant, some outside supportive, and this amounts to an autosuggestion to take a drink. This is a dangerous condition for the patient to be left in.

Ichthyol meets this indication more perfectly than anything else has done in the author's hands.

Ichthyol is said to be an alterative, an antiseptic, and a vasoconstrictor, but neither of these properties, nor all of them, seem to fully account for its action. The author's use of it, to a large extent, is empirical, but is based on his own clinical experience.

About thirteen years ago the writer's attention was directed to ichthyol in the treatment of tuberculosis by reading an abstract of an article by a German writer. This article reported the treatment of 65 cases of tuberculosis with ichthyol, given internally in doses of from 10 to 15 grains three to six times per day. The results were so much more favorable than the results of other methods of treatment that the author determined to try it in a case then under treatment. This case had resisted practically all the then-accepted methods of treatment. The patient had had fever for more than six months and was declining rapidly in spite of the most active treatment. Ichthyol was obtained and a 00 capsule full given three times a day.

The treatment the patient had been on was continued for ten days in connection with the ichthyol, but by that time a distinct improvement in her condition was noticeable. She was taking food more liberally and with relish. At this time all the other medicines were discontinued and ichthyol alone was given from that time on.

It had been almost impossible to get the patient to take nourishment enough to sustain her strength, but

within two weeks from the time of beginning the ichthyol all the food which was thought prudent to allow was taken with relish and more was wanted and this was digested and assimilated without difficulty. There was a persistent decline in the temperature until the normal was reached in about six weeks and the fever did not recur after that.

In a few weeks the patient was able to be up most of the day and convalescence was more rapid from that time on. In the course of three or four weeks from the time of beginning the ichthyol she was allowed all the food she wanted, and it was surprising, as well as delightful, to see how much she could eat and digest without the slightest discomfort from it. She gained flesh and strength rapidly and in six months was in good health, and has remained well from that time until the present writing.

This experience led the author to try ichthyol in other cases and during that year 16 cases of tuberculosis were treated with it with better results than any other line of treatment had ever yielded in his hands. The one uniform and really remarkable effect was shown in the prompt restoration of the appetite, accompanied by the ability of the patient to eat almost anything in liberal quantities and to digest and assimilate it perfectly. Intestinal fermentation and diarrhea, so often seen under forced eating, were entirely absent in cases in which the ichthyol was given.

The power of the ichthyol to increase the appetite and to promote digestion and assimilation of the food, with rapid increase in weight, led the author to make use of it as a flesh builder and an appetizer in all conditions where such a remedy was indicated, and this use has been attended by most satisfactory results.

In the treatment of chronic catarrh of the stomach of alcoholics the author formerly depended upon hydrastin or berberine with petroleum emulsion, but, while these are excellent remedies, they are so much inferior to ichthyol that they are not in any sense to be compared with it.

The power of ichthyol to contract dilated capillaries when applied locally to a mucous membrane has been long known, and the author is of the opinion that this, probably, accounts to some extent for the happy effect it has on the catarrhal conditions of the stomach in alcoholic cases. Whether this be the explanation of its action or not, the author cannot say, but from his wide clinical experience with it he is able to say that it meets the indications in these cases most perfectly; in fact, so perfectly that he does not hope for anything better.

Patients object to taking ichthyol for a few days, because of the sulphurous eructations from it, but its antiseptic effect arrests all fermentation in the stomach within three or four days from the time its use is begun, if taken regularly, and then it is no longer objectionable. There is no advantage in putting it in capsules, because the eructations are the disagreeable part of its effects and these occur just as badly if the remedy is given in capsules as if given in solution; therefore, the author has long since abandoned any effort to give it in that way.

It is best used in a 25 per cent. solution and this should be still further diluted when it is given. A 25 per cent. solution at times proves to be irritating to the throat, but if diluted with a swallow or so of water this does not occur. Cinnamon water disguises the taste to a greater degree than any of the other aromatic waters.

The following formula, usually employed by the author, has been the most satisfactory in his hands:—

℞ Ichthyol (Merck & Co.'s)..... ℥j.
Garantose,
Soda bicarbonate .....āā gr. iv.
Aquæ cinnamomi ..... ℥ij.
Aquæ pura .....q. s. ad ℥iv.
M. et ft. sol. Write, teaspoonful before each meal.

The garantose (saccharin), 1 grain to the ounce of mixture, sweetens it just sufficiently to take away the bitter taste, and the soda is added to render the garantose soluble; otherwise, these ingredients have no value in the prescription.

The indications to be met in some cases of alcoholism are simple, and the treatment can be easily carried out, while in others they are so complicated that the resources of the best-equipped institutions, as well as the skill of the most resourceful physician, will be taxed to the utmost; but with the aid afforded by a well-equipped institution, a competent physician can effect as large a percentage of cures in cases of chronic alcoholism as can be effected in any other serious ailment.

The most skillful physician cannot treat patients successfully at their homes. The disadvantage due to their home surroundings and the lack of complete control over the patient will defeat his best efforts. Even a general hospital does not assure the physician such control of the patient and protection from outside intrusion as this class of patients require.

Entire control of the patient and his surroundings is the first essential in the successful treatment of a case of alcoholism. Under the dominating influence of alcohol the patient cannot be expected to exercise self-control or restrain himself in the use of alcoholic drinks; therefore to succeed, others must be in a position to think and act for his best interest.

Patients who have become accustomed to the use of alcohol feel that it is their best friend; in fact, the only remedy that gives them relief from the intense nervousness which develops when they attempt to leave it off, and this fear of being deprived of it, as much as the physical suffering attending its disuse, leads them, if necessary, to resort to all kinds of expedients to supply themselves with it.

But when the patient is assured that his drinks will not be discontinued at once, but will be given to him as his condition demands, and this assurance is faithfully kept, he is soon led to have implicit confidence in the physician and in his ability to successfully carry him through the trying ordeal.

If the patient has reached such a state in the use of alcohol as to realize that he cannot himself abandon its use he is in a much more favorable condition to begin treatment, since it is very difficult to help a man do, to any advantage, what he feels entirely able to do himself. Still it is impossible at times to bring drinking men to admit that they cannot quit the use of alcohol themselves, and, yet, the author would not advise postponing treatment until they reach that mental state, because such postponement might lead to too much delay and to their ultimate and utter ruin.

But if the patient has reached the conclusion that he is in deeper water than he can wade through successfully alone, and voluntarily seeks the aid of the physician or an institution to help him out of his difficulty, he is in a very much more favorable condition to make that undertaking a success than had he not reached that conclusion; and, the final results of the treatment are likely to be more satisfactory. When a man has reached such a conclusion as this he is ready to lay down his business

and enter upon the real work of securing his freedom from a dominating, enslaving master with a singleness of purpose that makes success readily attainable.

The facilities of a well-equipped institution render the complete emancipation of a patient who has reached this mental state a comparatively easy matter. The patient should be away from home and free from all business cares, as the matter of taking treatment and being cured of alcohol addiction is a business sufficiently great and absorbing to require the entire time, attention, and energy of anyone; they cannot do this successfully while trying to continue business or do anything else. It is of sufficient importance to justify any man in leaving home and business, and only in that way can satisfactory results be obtained.

It is not best for him to undertake the matter as a secret. One who would accomplish any great end in life, as a rule, does not go about it secretly. Then, again, the fact of his drinking is publicly known, practically, in every case, and it is well for him to commit himself openly to a different type of life. If he slips away secretly, is treated, and drops back into his old ruts and with his old associates, they know nothing of it and, of course, will have made no change in their conduct toward him; therefore, they will expect, and will insist, upon his continuing his former life. Whereas if they know he has gone away to secure relief from the distressing condition into which this irregular and dissipated life has brought him, if they are his friends at all, they will co-operate with and support him in the new position he has taken. Therefore, instead of their influence being such as to drag him down and lead him to resume his former haunts and habits, it will be used to encourage and sustain him.

Then, again, a man's own pride of character and self-respect are involved. He does not like to have it

said that he has failed in anything he has undertaken. Therefore, if it is known that he has gone away and taken treatment for alcoholism and has fully committed himself to that undertaking, his own pride of character will lead him to do the very best he can to make a permanent success of it. Whereas, had he merely taken treatment at home, or slipped away secretly and taken treatment, without the matter being known, these influences to support him would not be present, and he would be more likely to return to the use of alcohol.

The mental attitude of the patient in any undertaking is an important one, but in this it is far more important than in ordinary affairs. The more fully the patient commits himself to the undertaking, the better results will follow. This is shown in the practice of almost every physician in cases where they are called upon to sober up and to treat alcoholic patients at their homes. A man has been drinking and has gotten into a bad way, is unable to go to his business, and sends for his physician. The physician visits his home and treats him for a few days, getting him back on his feet, and probably may have given all medicines that would really be indicated as therapeutic agents; yet, the patient looks upon it as a mere expedient and does not commit himself fully to the business of abandoning the use of alcohol; therefore, he gets up with a feeble mental resolve to leave it alone, and this resolution does not prove sufficiently strong and abiding to control his conduct, and in a few weeks he is again found indulging his appetite.

No permanent results, so far as the cure of the addiction is concerned, grow out of such an experience. Even if the physician understood these conditions perfectly and undertook to make the treatment so thorough as to effect a real cure of the addiction, he will find himself

unable to keep the patient away from business long enough to make a success of the undertaking. The author would not now undertake the treatment of any alcoholic under his home surroundings and would not advise anyone else to do so.

The author does not feel that he should close this chapter without a warning against any institution or physician offering to send a home treatment for alcoholics or drug victims. Such an undertaking is worse than folly, and, when a proposition of that kind does not spring from entire ignorance of the conditions to be met, it is prompted by criminal avarice. Especially fraudulent is the offer to send a remedy that can be administered in coffee, etc., without the patient's knowledge, and thus overcome the desire for liquor and break up the habit.

THE THREE-DAY LIQUOR CURE.

The time required for the successful treatment of a case of chronic alcoholism varies from two weeks to two months. Those who promise to effect a cure in much shorter time than that, promise more than they can perform. A "three-day liquor cure" is being advertised extensively throughout the country, and a number of institutes have recently been opened for the employment of this method.

This treatment consists of the administration of a dose of cathartic pills and after that the hourly administration of an emetic in liquid form, the emetic consisting of either lobelia or ipecac or of the two combined. An hour and a half from the time of giving the first dose of the emetic, the patient is required to take a drink of whatever alcoholic liquor he has been using and this is repeated every half-hour until four drinks have been

taken. All of these are promptly given over to the slopjar with interest.

The liquid emetic is kept up every hour for the first day, but only the four drinks are offered to the patient. If he asks for more liquor, it is given and this is followed by an extra large dose of the emetic, sufficient to insure immediate and prolonged vomiting. The second and third days' treatment are the same, only the emetic is given at less frequent intervals, and only two drinks are required to be taken on the second day. If the patient asks for more on that or on the third day, it is given, and this is followed by a double dose of the emetic.

The extreme nausea and vomiting from this course, if the patient can be made to take it, is supposed to disgust him so completely with whisky that he will not take it again. By the time he has been kept in this condition for three days, he is so disgusted with whisky, himself, and everything else that an effort to swallow anything will cause him to vomit. It is true that he does not want whisky, because he is not in condition to take and retain anything, but he is no more cured of the whisky habit than he would have been had he drank until his stomach rebelled and he had vomited three days and nights from the effects of whisky.

His system is still in a badly disordered condition; he is extremely nervous and cannot sleep, is totally unfit for business, and if he recovers it is because of the restorative forces of the system and not because of any curative effect the treatment had on him. Such sleight-of-hand fake methods cannot be too strongly condemned. There is no curative value in them and the public should be taught to avoid them.

In undertaking the treatment of alcoholic patients, the physician should take a comprehensive view of the

patient and his surroundings and endeavor to estimate correctly every influence which has in any way contributed to his enslavement, and to direct the life of the patient thereafter so as to remove every one of the hurtful influences, as far as is possible.

The physical man must be completely renovated and every function of the body restored to normal activity.

The mental bias favorable to the use of alcoholic liquors must be eradicated and in its stead a positive aversion to alcohol must be established.

The patient is to be given a new chance in life by being put on his feet with a clear head, in full control of all his faculties, and free from the dominating influence of alcohol. The consummation of such a work is certainly worthy of the best efforts of any man.

CHAPTER XXIV.

CHRONIC ALCOHOLISM A DISEASE: ITS CURABILITY.

THAT the author's views as to alcoholism being in reality a disease, and that the same is curable by treatment, may not be considered extreme or out of harmony with the most approved teachings of the day, extracts from the writings of leading men engaged in the study and treatment of inebriety are given in the following pages.

Norman Kerr, London, in his work on "Alcoholism," says:—

"WHAT SHALL WE DO WITH THEM?

"Such are our diseased habitual drunkards. What are we to do with them? Some reply, 'Drunkenness is a vice. Let them kill themselves; why should they not? and the sooner the better.' How such an answer could be given, how such a line of conduct could be defended in this nineteenth century of the Christian era, is utterly beyond my comprehension. Let the beginning of the hapless victim's intemperance have been in thoughtless abandonment to a dangerous pastime, in selfish indulgence in a vicious habit, or in criminal dalliance with an unlawful pleasure, as he crouches at my feet, and with palpitating heart and quivering tongue, implores me to save him from himself, if I could turn coldly away and bid him go, die, and make a speedy ending on't, I could but look upon myself as:—

> "'A stony adversary, an inhuman wretch,
> Uncapable of pity, void and empty
> From any dram of mercy.'

"It may be in strict accordance with the stern decree of justice, though I doubt it, to leave the unhappy victim to his fate and raise not a hand to stay the arm upraised to bear the poisoned chalice to the mouth. It may be just, though I more than doubt it, for those who, with a healthy brain and strong will, aided by intellectual, moral, religious, and social restraints, having been preserved from falling under the sway of that devouring appetite to which a diseased brain, a feeble will or a hereditary predisposition through the poisoned body and brain of one or both parents, has rendered others an easy prey, to pass by on the other side and leave the drunken slave, with no hope but the grave, to his chains, his wretchedness, and his despair. But is it right? Let us treat the despairing captives of alcohol as we ourselves have been treated—let us deal with them as we have been dealt by—let us temper our justice with that compassion to which we owe so much—let us be just, but too, be merciful.

> "'Why all the souls that were forfeit once;
> And He that might the vantage best have took
> Found out the remedy. How would you be
> If He, which is the top of judgment, should
> But judge you as you are? Oh, think on that,
> And mercy then will breathe within your lips,
> Like man new made.'

"But it has been urged that the cure of the habitual drunkard is hopeless. Were it so, the enterprise is yet lofty, the undertaking noble. Could we do no more than snatch the victim for a time from his persecutor and restore him to tolerable health and strength, to such health and strength that if he only keeps the enemy at bay by totally abstaining he will be permanently cured, we should achieve something well worth trying for. The difficulty of an undertaking is no reason why we should not attempt its accomplishment, and hard though the task may be, we have much to encourage us. The possibility of the permanent reformation and cure of habitual drunkenness has now been placed beyond dispute by a great company and cloud of witnesses.

"Even Bad Cases of Inebriety are Curable.

"A few years ago a magistrate's clerk in the metropolis is reported to have declared, in the course of a trial involving the character for temperance of one of the witnesses, 'Everybody knows that teetotalers are nearly all reformed drunkards.' Were this true it would indeed be a magnificent result, as it is generally conceded that there are more than 4,000,000 of adult water-drinkers in the realm; but though I fear we cannot claim anything like so great a triumph, I have no hesitation in saying that I am within the mark when I aver that a quarter of a million of human souls have in this country alone been raised from drunken death to abstaining life.

"I have myself known of the cure of what seemed to be absolutely and hopelessly incurable cases, and my own efforts in the cause of abstaining temperance have taught me that no case is utterly hopeless and wholly beyond remedy, so that I will never despair of the rescue of anyone, no matter how shattered his nerves, or how weak his resolves, or though he be:—

"'A creature unprepared, unmeet for death.'

"In the long roll of temperance worthies will be found the names of many a brand plucked from the burning, and no conqueror of ancient or modern times can boast of so numerous and glorious an array of hard-won trophies as can the great total abstinence movement, wherever with true Christian fervour it has raised its triumphant banner aloft."

B. C. Keister, Richmond, Va., says (Senate Document No. 48, 1909):—

"We also find by clinical and microscopic observation that by the constant but moderate use of alcohol a hardening of the walls of the blood vessels, which is soon followed by a thickening, due to an increase of fibrous tissue, which leads to a lack of normal elasticity and contractility on the part of the vessel walls.

We then have a delay in the blood current, and finally a stagnation or stasis of the circulation. This condition may occur in any part of the body or in any of the organs, and is known to physicians as fibrous or fatty degeneration.

"With this abnormal condition of the blood vessels in the brain, we may, on the slightest provocation, such as a sudden fright, a hearty meal, or anything that may cause undue agitation of the heart, have a rupture of a blood vessel, followed by paralysis or apoplexy. With this condition of the blood vessels of the liver and kidneys, we may have such a change in the functions of these organs as will give rise to symptoms that are equally as alarming.

"These pathological conditions, according to microscopic investigation, are brought about by no other cause, old age excepted, than alcoholic drinking.

"It is a true saying that 'a man is no older, no younger, and no stronger than his blood vessels.'

"We have a most deplorable condition of the vessels, the cells, and walls of the stomach in persons addicted to the moderate use of alcohol, giving rise to the many and varied symptoms of effects of alcohol on the pepsin of the gastric juice. It is claimed that 1 grain of alcohol is capable of destroying 800 grains of pepsin.

"One of the well-known characteristics of alcohol is its power to extract water from any object with which it comes in contact; hence its deleterious effect on the blood corpuscles, which contain 79 per cent. of water; also the gastric juice, which contains 97 per cent. of water; the pancreatic juice, which contains 90 per cent. water; the saliva, which contains 99 per cent. water; bile, 87 per cent. water; muscle, 75 per cent. water; brain, 80 per cent. water, etc. It extracts the moisture from the 5,000,000 little cells that supply the gastric juice to the stomach and destroys the protoplasm of the epithelial cells of the lining of the stomach, and in so doing the functions of this important organ of digestion are

almost obliterated. We find that the entire alimentary canal is more or less affected by this same destructive process; in fact, no part of the human structure escapes the destructive influence of this insidious enemy.

"The brain and nerves being of a watery character (80 per cent. water) renders them very susceptible to the influence of alcohol. The microscope shows that grave alterations take place in the protoplasm of both the nerve cell and fiber under the action of alcohol after it has been freely taken for some time. It is a well-known fact that alcohol is a powerful protoplasmic poison, it having a special selective affinity for the delicate cells of the brain and nervous system, with whose function and capacity it interferes even at a very early stage, and finally causing permanent gross alterations in the tissue which are demonstrable to both the naked eye and through the microscope. A cell damaged in this way never recovers. It has been demonstrated by clinical observation that alcohol has been found pent up in small sacs on the brain in persons who have been chronic drinkers. It may be found in various quantities. 'Enough alcohol has been repeatedly found in the brain of a dead toper to spoon out into an open dish and set on fire.' We may have, as a result of this accumulation of alcohol, pressure on the brain substance, giving rise to such diseases as apoplexy, epilepsy, delirium, and insanity. The brain is hardened by the alcohol on account of its power of absorbing the water therefrom, causing a very marked disturbance in the transmission of thought and nerve force, impairing to a certain extent all the mental faculties. When we consider these pathological conditions of the brain and nerves, wrought by alcohol, is it any wonder that we have such an increase of nervous diseases, insanity, epilepsy, feeble-mindedness, both hereditary and acquired?"

Charles A. Rosenwasser, Newark, N. J., says (Senate Document No. 48, 1909):—

"Doctor Day, for many years head of the Washingtonian Home, Boston, an institution now in the fifty-second year of its existence, made a study of 8000 cases that had been under treatment and found over 30 per cent. sober and temperate. He says:—

" 'Twenty-two years of experience in this work has taught me that the task is neither hopeless nor thankless; nor would it be if the measure of success had been lessened one-half from the known rate of percentage of cures.'

"Progressive Switzerland has long since learned that inebriety is a curable disease and that it pays to maintain a hospital for the purpose. At Ellikon, near Zurich, there has existed such a hospital for the past nineteen years. The result of its labors is most encouraging and proves conclusively that the treatment of inebriety has long since passed the experimental stage.

"At Knoxville, Iowa, there has been in existence for the past three years a state hospital for inebriates, and the results thus far are very satisfactory. From the second biennial report of this institution we learn that of the entire number of patients treated (774) 41⅓ per cent. are known to be cured and living up to the conditions of their parole.

"Minnesota has also taken the proper step in this matter, and last year established a farm for inebriates. Surely the knowledge of the excellent results obtained in the above-mentioned institutions, as well as the results obtained in the great number of private and public institutions for the care and treatment of inebriates in this country and abroad, ought to convince the most skeptical, and should serve as a great stimulus in our efforts to overcome the obstacles which we encounter in the path of rational treatment of the inebriate, and there are many obstacles to be overcome."

Howard A. Kelly says (Senate Document No. 48, 1909):—

"Those who drink constantly in so-called 'moderation' often develop alarming symptoms, in time associated with diseases of a degenerative character affecting in the lines of least resistance one or other of the great vital organs of the body. In operations these factors demand careful consideration. In the prognosis they are as a rule more important than any other factor; a habit of 'moderate' or excessive drinking lowers the vitality and lessens the reparative powers, so that serious postoperative complications are likely to follow and interrupt or even cut short the convalescence in such cases.

"One of the most alarming effects is that observed in the arterial walls and in the heart muscle, which are weakened. The impairment of nutritive processes is another pronounced factor. All rational surgery and treatment of disease takes into serious account the question of the use of alcohol by the patient. This is science and not sentiment or theory. . . .

"One of the greatest lessons life has taught me is that great truths grow not stale, but sweeter with repetition, so I do not hesitate to remind you of certain things, though you know them. I therefore pause a moment as I approach my conclusion to consider some of the common arguments against total abstinence urged by a friend of mine a few days since as we discussed this momentous topic. First and foremost stands that time-honored assertion so often heard on the lips of the drunkard, as well as of the moderate drinker: 'It is a sign of weakness to pledge myself to abstinence. My will is strong enough; I can control myself; I can quit when I will.' It seems to me, I replied to my interlocutor, that the best answers to arguments in the realm of morals are the facts, and here they are undisputed: Out of all the drunkards and the tens of thousands of criminals made what they are by alcoholic liquors, of the thousands who fill our insane asylums and the tens of thousands of dependents in our poorhouses, it would be hard to find one not equally assertive of the sovereignty of his will in all his acts and of his entire ability

to take liquor or to let it alone, as he might choose, when he started out.

"It is pitiful to hear now and then even a poor, debauched drunkard, with one foot slipping over the edge of the grave, still reiterating this same old worn-out phrase. I think I still hear the last feeble refrain as he topples into the grave, 'I can,' but all who pitifully watch him know that he can't. What a peculiarly damnable trait it is in alcohol, that while it is literally destroying the highest centers in the brain and wiping out the fibrils of association so necessary to the will in forming a judgment to act or to restrain it yet deludes its victim into thinking that he has quickened powers, a stronger will, and a better judgment. Those are interesting experiments cited by the Rosanoffs and adverted to by President Eliot, of Harvard, in his paragraphs in the Ladies' Home Journal (March, 1909) where the typesetters were tested with typewritten copy under moderate drinking and after abstinence, when it was found that, while they often thought they were doing more work under the influence of the drug, in reality they were doing far less. It is evident from these experiments that a liquor-imbibing nation assumes a heavy handicap in the race for industrial supremacy.

"I hear the makers of alcohol, at last roused by the prohibition wave, crying out that they stand for its moderate, not for its immoderate, use.

"In reply to this I answer that if they make it and sell it the use is practically beyond their control, and that their plausible declarations are as light as the paper on which they are written, and can in no way affect its use, whether moderate or immoderate. I further inquire why these gentlemen have been so long in reaching this benevolent conclusion. I declare that I believe their contention and their expressed desires are specious and false, and, further, I aver that, judging by such scientific evidence as we now have, there is no such thing as a moderate use of alcohol."

C. A. McBride, M.D., L.R.C.P.S. (Edin.), in his recent work on "The Modern Treatment of Alcoholism," says:—

"THE CONSTANT DRINKER.

"In this division may be placed all those inebriates whose disease leads them into a daily indulgence in stimulants. They feel the need of the narcotic upon awakening each morning, and as the effect of each drink wears off during the day they feel the need of another, and this condition persists throughout the days of the year. There is no period of the twelve months in which they are indifferent to alcohol, and if from any cause they are deprived of it they are conscious of a deficiency in their economy, the absence of something which they find necessary to enable them to act and feel normal. The term normal is not a correct one, for no inebriate can possibly be normal, but it is the only one which conveys a clear idea of how the inebriate feels when he has had just enough alcohol to steady his shaky hand, clear his confused brain, sharpen his appetite for food, and tone up his nerves generally.

"Deprive him of this necessary amount of alcohol, and he is like a piece of machinery working with all the connections loose—there is a jarring and jolting of the whole machine; but stoke him with the right amount of alcoholic fuel, and like the adjusted machine he steadies down, and if the working is not perfect at least gives a passable performance. There is no period during the whole year in which the victim is absolutely free from bondage.

"He may by the exercise of will-power or under the influence of some powerful motive cease to indulge for a longer or shorter time, but during the whole of this period of abstinence he is more or less conscious of what we term craving, and although his general health may improve owing to more regular habits in eating and sleeping, coupled with the absence of the narcotic, yet he will tell you that there is a feeling of something wanting which he

finds difficult or impossible to satisfy. This is not caused by the mere cessation of a daily habit, although that may in part account for his feelings; it is due to something far more deeply rooted than habit, for it comes from the man's very nerve cells themselves.

"It is a real hunger of the cells, calling for the narcotic with which they have been supplied so regularly and so long that they have ceased to provide for themselves, and have learned to depend upon this constant supply. This craving is an expression of the sensory nerve cells. It is well known that the effect of coddling any part of the human system is to make that part less resistent against the very forces from which it has been screened. An unnecessary amount of clothing worn makes the wearer less resistant of cold; living in overheated rooms causes an undue sensitiveness to draughts, etc.

"So it is with the alcoholic. He coddles his sensory nerves with the benumbing effects of alcohol, and thereby lessens the transmission to the brain centres of uncomfortable sensations from different parts of the body.

"He feels more comfortable because he has cut the communication between the brain and the more or less uncomfortable parts beyond. By constant repetition of this, the sensory nerve cells become hypersensitive, and when there is a temporary withdrawal of the narcotic they are more sensitive to the usual stimuli, and he feels what he terms a craving.

"He terms it a craving because he knows that alcohol will stop it for a time, *i.e.*, for so long as there is sufficient left in the system to benumb these cells.

"In this division of alcoholics the craving is present whenever the supply is stopped. This craving is present in many men who not only are not aware of it themselves, but sincerely pity others in whom they recognize its presence. Take the large class of city men who transact business over a glass of wine or whisky-and-soda. These drinks are repeated again and again during the

day as a mere adjunct to doing business. It becomes a daily custom to them, just as eating their meals.

"After this has gone on for a few years, tell one of these men that he has become an inebriate and he indignantly protests, but ask him to test the matter by voluntarily abstaining for a month, and he is surprised by finding himself possessed of a craving for stimulants.

"This is the test I always apply in such cases. If he does not miss the alcohol during the month of abstinence, and if he finds his nerves as steady without it as with it, then he has not yet contracted the disease; but if, as many do, he finds himself not up to the mark in various ways, he is already a victim and differs from the poor inebriate whom he so sincerely pities, or maybe condemns, only in degree—a degree which time and indulgence may rapidly obliterate.

"If any of the many who boast of their ability to take alcohol daily without harm, and who scorn the poor fool who cannot do the same, will try the simple test which I have mentioned, they may find a painful surprise in store for them.

"Voluntary Drinkers.

"The fourth class of inebriates are, strictly speaking, not medical cases at all. They are the voluntary drinkers, and for a certain period in their lives are not afflicted by any craving for alcohol. In the beginning it is not the physical but the moral side of them which is at fault. Nevertheless, as they often eventually become inebriates, it is necessary to consider them from a medical point of view.

"The distinguishing point about them is that they have no physical craving for alcohol, and drink from mere caprice. If asked to join a drinking party they will do so, and become intoxicated for the mere fun of the thing. They drink in order to get drunk, either for the pleasure it gives them or to forget their trouble and sorrow, and when the occasion passes which caused

them to drink they sober up entirely free from any physical craving, and will not drink again until some special circumstance induces them to do so.

"They can be drunk or sober at will, provided they have the means to pay for it. Their drinking is a mere vice, and it is the confusion of this class of drinkers with the genuine inebriates that has caused so much misunderstanding of the whole question. It is necessary to make this point quite clear, namely, that there are two classes of drinkers—those who get drunk from mere vice, and those who do so from a need to satisfy a physical craving. Let this be clearly understood, and the great controversy which has raged for ages and which is still raging will cease, and the preacher, the temperance lecturer, the social reformer, and the laity generally will cease to hold diverging views, while the genuine inebriate will get more consideration and suffer less undeserved persecution by the self-righteous, uncharitable critics who pass judgment upon them, in their ignorance. The whole ground of treatment would also be placed upon a clear and rational basis. Millions of money which is now wasted in misguided efforts would be spent in a useful direction.

"It is only fair to add that the laity are not altogether to blame in this matter, for until recently only a small proportion of the medical profession understood the true nature of inebriety; indeed, one can go further, and say that even to-day doctors are to be found who are still ignorant concerning this question, and consequently are misleading the laity. Magistrates, from their large experience of such cases, are far better informed upon the subject than many of our profession. Every specialist in inebriety knows that immeasurable misery and harm has been done, and is being done, through the misunderstanding of the facts. When we come to consider the question of treatment, I will show how this misunderstanding works a further immeasurable harm.

"The first essential in the treatment of alcoholism is to recognize that inebriety is a disease. Unnecessary as this state-

ment may seem, yet we find many to-day who do not believe it, and it stands to reason that if the doctor starts with the belief that his patient has no disease he is not likely to cure him.

"Admitting alcoholism to be a disease, it is our duty as doctors to find a remedy for the complaint. One of the objects of this book is to show that such a remedy has been found, and in what cases it is successful, and how to administer it in order to obtain the best results. The question of treatment may be divided into several divisions, namely, the moral treatment, the treatment by restraint, the treatment by law, the treatment by diet, etc., and the treatment by drugs.

"The method or methods of treatment pertaining to each of these divisions are essential to success. We are not only dealing with the physical body, but with human nature in all its various complications, and we are compelled to consider our patients in relation to the question of heredity, of environment, of social customs, social status, of climate, and even race. The religious belief of the patient may have to be taken into account. It is evident that no 'rule of thumb' will serve us here.

"A very broad conception of the whole question and a combination of the various methods are necessary if we wish to be successful in the treatment of the majority of our patients. I am convinced that this very lack of combination accounts for so many recorded failures. Let us take these various methods of treatment in their order, and study their effect upon the different varieties of the disease.

"The Treatment of Alcoholism by Drugs.

"Before proceeding to detail the actual method of treatment by drugs, I would like to say a few words about the history of the movement in this country. One is quite accustomed now to hear of a patient going away for six weeks and returning cured of his alcoholism; but that is of very recent date. One did not hear of it, say, ten years ago—or at least very seldom. Ten years

ago any advocate of the short term of drug treatment for alcoholism was more often laughed at than listened to.

"When I founded the Norwood Sanatorium my greatest difficulty was in persuading the profession that there was anything in the treatment of alcoholism by means of drugs. One easily remembers the incredulous smile with which one's statements were received. One reads of our insular prejudice, but to realise it it is necessary that one should be a social reformer in some direction; then, and only then, can one get the faintest idea of its vastness and its stolid stupidity.

"I no longer wonder that the French shrug their shoulders at us in despair. But, like every other truth, this treatment had to prevail in the end. When I opened the Norwood Sanatorium patients came to me in spite of the doctors—not on account of them. Some were told by their doctors that all sorts of harm would befall them if they took the treatment; not one, but several, were told they might consider themselves lucky if they returned alive. Others were told that the treatment would affect their heart in various ways. Others, that their mind was in danger. In the denseness of their ignorance of the whole question a certain section of the profession carried their opposition to an extent that was actual persecution. Nevertheless, patients presented themselves for treatment, were cured, and reported themselves to their doctors on their return home. Thus was the truth greatly manifested.

"To show to what an extent a prejudiced person may sometimes go rather than relinquish his prejudice, the following incident will serve. A patient entered the sanatorium with a history of daily drinking to excess covering a period of several years. His failing was known to all the villagers, as he might be seen any day reeling about the streets. He informed me that his doctor had done all he could to prevent him coming, and prophesied that he would return in his coffin.

"When he returned home not only alive, but sober, this doctor made a bet that he would be drinking again inside of a

week; losing this bet he made another—that the patient would be drinking within a month; when he lost this also he made a still further one—that he would relapse inside three months. On losing this bet, in order to prove that his opinion was correct, he resorted to a trick of such a dastardly nature that without the fullest proof I could not credit it of any member of our profession. Noticing that his former patient had a slight cough, he called him into his surgery and made him up a cough mixture—or at least a mixture purporting to be one.

"This mixture contained principally alcohol disguised. On the patient attempting to take it he vomited freely, telling his wife that there must be something wrong about it. But his wife told him that some cough mixtures were intended to make one sick—so he took it again, with a similar result. On asking the doctor for an explanation, the doctor only laughed, but admitted later on what he had done. Here is a case of a man engaged in one of the noblest professions risking this man's whole career rather than give up his prejudice. Although this happened fifteen years ago, I am glad to be able to say that the patient has never relapsed and has held an important position all that time. Could prejudice go further than this? I think not. Truth generally triumphs in the end, and now we find the treatment which was laughed at a few years ago given the foremost place."

CHAPTER XXV.

DELIRIUM TREMENS.

This condition may be defined as a functional disturbance coming on during the course of chronic alcoholism. The structural lesions are the same as in chronic alcoholism without delirium, but the structural lesions are not the cause of the delirium or of the other nervous manifestations peculiar to this condition.

The delirium is a direct product of a toxin in the blood. This poison doubtless consists in part of alcohol itself and of the oxidized products of alcohol, and in part of the products of tissue disintegration and their fermentative compounds. It is, therefore, a mixed toxemia, a drug, intestinal, and auto- toxemia. The severity of the attack—other things being equal—depends upon the degree of concentration or potency of these poisons.

An attack may be precipitated either by an unusual excess in the consumption of alcohol in a habitual user of it or by its sudden withdrawal; also by shock or traumatism.

The treatment usually advised is the immediate withdrawal of alcohol and the administration of sedative drugs to procure sleep. Tyson, "Practice," ed. 1909, says: "The first indication after the withdrawal of alcohol is to procure sleep." For this purpose full doses of sedative drugs are recommended. Anders's "Practice," last edition, advises the entire withdrawal of alcohol and the administration of morphine and hyoscine to procure sleep.

Nine writers out of ten agree with the recommendations above quoted. All advise the administration of

purgatives, but these are given a secondary place. The first and principal endeavor is to quiet the patient and secure sleep by the administration of large doses of narcotic and sedative drugs. When sleep is secured in this manner, in many instances, far too many, the patient goes to sleep only to lapse into that long sleep which knows no waking.

This statement can be supported by almost unlimited evidence, but to quote the results of 500 cases of delirium tremens treated at the Cook County Hospital, Chicago, for the period June, 1905, to August, 1908, as reported by Ransom, *Journal American Medical Association,* April 17, 1909, will suffice. In this series about one-third were delirious when admitted; the remainder developed delirium after admission. The average death rate of the entire 500 cases was 26.4 per cent., but in 261 of these cases sedative drugs were given, and in these the mortality ran up to 41.7 per cent. Bromides, chloral, morphine, and scopolamine were the sedatives given.

In 55 out of the series of 261 only small quantities of these sedatives were given, and in this series the death rate was 21.8 per cent., but as the quantity of sedatives given increased, the death rate increased. In the 72 cases receiving the largest quantity of sedatives—estimated to be equivalent to 180 to 240 grains of chloral in each twenty-four hours—the death rate was 65 per cent.

A mortality such as the above in the treatment of any disease certainly calls loudly for a re-examination of the foundations upon which our plan of treatment rests. The author has felt the necessity for a re-study of this subject for a number of years, and has devoted considerable time to it. The object of this paper is to record the results of that effort. The plan of treatment herein

outlined is presented as the result of his own clinical experience.

The indications in the treatment are:—

Support of the vital functions.

Control or arrest of delirium.

Removal of poison from the patient's blood.

In attempting to carry out these indications, the condition of the patient in all particulars must be carefully estimated. It will usually be found that the stomach is much deranged; that the fluids taken have either been vomited or have been but sparingly absorbed.

Profuse perspiration is another symptom. This excessive leakage of the watery element of the blood from the pores of the skin, with the diminished intake or absorption of fluids, pathologically reduces the volume of the circulating medium. In well-developed cases the pulse is rapid and deficient in volume: the heart is working itself to exhaustion in an ineffectual effort to keep up the circulation with an insufficient volume of blood.

The spleen is usually acutely enlarged and there is a general venous stasis of the portal system. The functional activity of the digestive, secreting, and excreting organs is greatly diminished, if not entirely suspended. In many cases the mental excitement is so great as to attract and practically monopolize the entire supply of nerve energy, thereby depriving the eliminating organs of excitor impulses to such an extent as to render them inactive. *Our efforts should be directed to the restoration of a physiological distribution of both nerve energy and blood-supply, as well as the elimination or dilution of the poison upon which the excitement depends.*

For the purpose of treatment these cases should be divided into two principal classes: the hyperemic, or sthenic type, and the anemic, or asthenic type. In the

first an essential factor in the production of the delirium is an hyperemia of the brain.

In this class all drugs which increase the blood-supply to the brain increase the delirium. In these cases such drugs as strychnine, hyoscine, and morphine are not only harmful, but they are deadly. In the other class there is anemia of the brain, and the very drugs which are contraindicated in the hyperemic cases are the ones which give the best results in this class of cases; on the contrary, the bromides and other cerebral sedatives are hurtful.

About 90 per cent. of the cases coming under the author's care have been hyperemic and 10 per cent. anemic. It is not always easy to classify them, but when in doubt the administration of a few doses of gelseminine will usually show whether they are anemic or hyperemic. If the case is of the anemic type the delirium will be increased by the effects of this remedy, but if it is of the hyperemic type the delirium will not be aggravated, but will usually be markedly quieted. This test will furnish a clew to the proper class of therapeutic agents to be employed in combating delirium, but the administration of medicines alone is not to be depended upon. The plan of treatment which the author has devised is as much surgical as medical.

As above suggested, the volume of blood in the hyperemic cases is less than normal. This decrease occurred, to a large extent, because of the excessive leakage of the watery element of the blood through the pores of the skin, but the fluid thus escaping carried out with it only an insignificant quantity of the total accumulation of toxic matter.

The fact that the skin has not permitted any material quantity of these poisons to escape with the fluid which

formerly held them in solution has left the blood a far more concentrated and toxic solution.

In normal salt solution we have a remedy with which this condition can be successfully combated. As a primary step in the treatment, fill the colon with this solution, and repeat the same as often as it is absorbed, about every two hours, but if the attack is severe do not depend upon the colon alone as a route by which to introduce this solution. Supplement it by hypodermoclysis, and in extreme cases by intravenous injection, the purpose being to force fluids into the body until the entire arterial and venous systems are filled to their utmost capacity.

The condition of the patient usually greatly improves upon the successful carrying out of even this step in the treatment. The heart, having an ample volume of fluid to handle, acts much less rapidly and propels a larger quantity of fluid by each contraction, as indicated by a more full, soft, and less rapid pulse.

The addition of this fluid to the concentrated solution of poison of which the diminished volume of blood consisted materially dilutes and renders less irritating the poison in the blood; it also, in a very short time, brings about free action of the kidneys and thus one of the channels of elimination is opened up. As a rule, even this degree of dilution of the poison lessens the mental excitement and allows a more normal distribution of nerve energy of all the vital organs.

Elimination of the poison is essential to a cure, and the bowels and the kidneys are the organs upon which we must depend for that work; therefore, at the beginning of treatment, begin the administration of calomel in doses of 3 to 5 grains every hour, and continue until as much as four full doses have been retained. This

calomel will not act as a purgative while the mental excitement continues to be so great, but it will be in the system ready to act when the condition of the nervous system has been so quieted as to permit it.

After the colon has been used for the purpose of absorbing saline solution for a few hours, it should then be brought into use as an eliminating organ. Full doses of Epsom salt or other saline should be given and repeated at frequent intervals until large quantities of liquid stools have been passed. The mental excitement does not retard the action of the saline cathartics as greatly as it does the action of cathartics of other classes. Their action is quite effective in this condition, as the watery discharges they induce drain out of the blood a large quantity of the poison with which we are contending.

After beginning the administration of the salts, the colon can no longer be used as a route by which saline solution can be introduced into the system; therefore, one or both of the other methods should be continued, supplemented by free administration of water by the stomach, when that can be done, to the end that the system may be kept well supplied with fluids while it is necessary to drain the same out by the kidneys and bowels.

This practically amounts to washing the poisons out of the blood by forcing fluid into it and draining it out by the natural channels. The quantity of poison eliminated by the skin is so small that it is hardly to be taken into account. Bouchard has shown that the bile is about nine times as toxic as the urine, and that the urine is about fifty times as toxic as the fluids excreted by the skin. Doubtless other matter excreted by the bowels is fully as toxic as the bile.

SUPPORT OF HEART AND STIMULATION OF KIDNEYS.

The free administration of the normal salt solution so improves the heart action that it is often unnecessary to administer other agents for that purpose; still, as a further precaution, it is well to administer sparteine sulphate from the beginning of treatment until the patient is well on the road to convalescence. This is done for a double purpose. Sparteine is not only our most reliable heart tonic, but a good, non-irritating diuretic. It increases the force and lessens the frequency of the heart's action, dilates the smaller arteries, especially the arterial capillaries, and aids greatly in restoring circulatory equilibrium. Its action seems to be confined to the cardiac centers. It does not stimulate the central nervous system, as do strychnine and other remedies of that class, and does not increase the delirium.

Its action as a diuretic is not well understood, but it is probably due to its power to improve the capillary circulation in the kidney. It should be given hypodermically in doses of 2 grains at intervals of from two to six hours. Fractional-grain doses of this remedy are entirely insufficient. It should be given in both the hyperemic and the anemic type of cases. It aids materially in meeting two of the indications in the treatment of this condition, that of supporting the heart and promoting elimination by the kidneys. It is, therefore, a remedy of the greatest value.

CONTROL OF DELIRIUM IN THE HYPEREMIC CASES.

The active and often violent delirium is a most troublesome and dangerous symptom. The mental excitement accompanying it not only throttles the activity of the eliminating organs, but under it the patient ex-

hausts himself in struggling with or hiding from imaginary enemies; therefore, the control of this symptom is of first importance, but it must be done by agents which promote rather than hinder the action of purgatives, diuretics, and other more strictly curative agents.

In the hyperemic cases gelseminine is the remedy *par excellence* for this purpose. It should be borne in mind that the medical plant gelsemium yields two alkaloids, gelseminine and gelsemine. It is unfortunate that these alkaloids have been given so nearly the same name, as their action is not at all similar. Gelsemine is a stimulant and motor excitant, resembling strychnine, while gelseminine is a motor depressant and cerebral sedative. It is to the latter alkaloid that this plant owes its medicinal value.

This remedy should be given in doses of $\frac{1}{25}$ grain at intervals of from one to two hours in the hyperemic cases, and continued until its full physiological effects are established, unless the delirium and other excitement is sooner allayed. It lessens the blood-supply to the brain and thus directly combats the hyperemia, upon which the delirium largely depends. It does not injuriously affect the heart action or systemic circulation, and is not incompatible with sparteine. The effects of these two remedies can be established in the system at one and the same time.

The sedative effects of gelseminine on the cerebral centers is such as to materially reduce the delirium in the most aggravated cases, and in the milder cases it often promptly arrests it. Its effects in reducing cerebral excitement permit a more even distribution of nerve energy, and this brings about a condition in which the eliminating organs can respond to the purgatives and other curative agents. It not only establishes a tempo-

rary quiet, but promotes the action of other agents. Patients often sleep from its effects.

CONTROL OF DELIRIUM IN THE ANEMIC CASES.

The delirium in this type of cases differs materially from that of the hyperemic type, especially in the stage of development. In the hyperemic cases the delirium develops rapidly. Usually within a few hours or a day at most, the delirium is active. In the anemic cases the delirium develops slowly. The patient will see a snake, or other unpleasant objects; the shock attending this acts as a stimulant and causes the heart to throw a more abundant supply of blood to the brain. The cerebral anemia is temporarily overcome and the mind becomes clear.

In a short time, as the effects of this excitement subside, the blood-supply to the brain again becomes deficient and another hallucination occurs, followed in turn by increased activity of the circulation and the disappearance of the delusion. This phenomenon occurs at intervals more or less frequent, sometimes running one, two, or several days before the patient is continuously delirious.

In this class of patients gelseminine would still further lessen the blood-supply to the brain and increase the delirium. Bromides have a similar effect. It is in this class of cases that hyoscine and strychnine have proven so valuable, but strychnine is much to be preferred. It is a general systemic and cerebral stimulant, and by increasing the blood-supply of the brain it lessens or suspends delirium.

Under these conditions an excitomotor stimulant proves to be a sedative. The rest and repose induced by it allow or promote a more even distribution of blood-

supply and nerve energy and thus bring about a condition in which the eliminating organs will respond to stimulation. Not only that, but strychnine stimulates the motor functions of the bowels and thus directly promotes the action of cathartics, the principal curative agents.

BLOOD-PRESSURE IN THE ASTHENIC TYPE OF CASES.

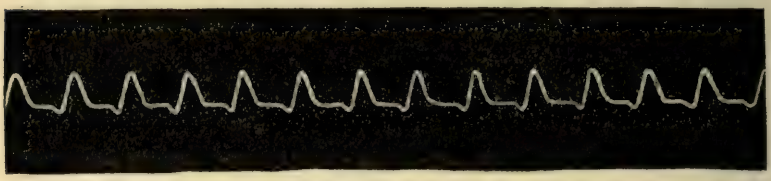
It is extremely difficult to get accurate blood-pressure records and the pulse tracing in delirium tremens cases, especially in the sthenic type of cases, because of the difficulty in keeping the patient still long enough to obtain such records, but in the asthenic, or anemic, type this difficulty is not so great. In the asthenic type the author has been able to get accurate records in a number of cases, sufficient to afford a fair index to the condition of arterial tension in such cases, but in the sthenic, or hyperemic, type he has not been able to get records in such numbers as to justify a general conclusion.

The one striking feature in the anemic type of cases has been the uniformly low pulse-pressure, the abnormally small difference between the systolic and the diastolic pressure. So long as this abnormally low pulse-pressure continued the delirium continued, but as the proper relation between the systolic and the diastolic pressure was restored, either by the temporary effects of the remedies administered or by general improvement of the patient's condition, the delirium subsided.

The author points to this fact, now instrumentally verified, in support of his contention, announced some years ago, that the condition of the cerebral circulation, as indicated by a low or high arterial tension, is an important factor in the causation of the delirium; and, that it also furnishes an index to the class of remedies to be used in its control.

In the sthenic type of cases, strychnine and other cerebral stimulants increase the delirium, while in the asthenic type they allay it.

The blood-pressure and pulse tracings in the following case are typical of the author's series of anemic cases: J. T. P. Aged 35. Weight, 160; admitted June 17, 1912. Had been in stupor with intermitting, mild delirium for several days; was brought from his home on stretcher. Had not been able to get him to take either medicine or whisky for a couple of days. Physical examination showed conditions usually found in chronic



Tracing No. 1.

alcoholics, with possibly an exaggerated degree of muscular relaxation and with more than usually marked irregularity of respiration. Pulse rate was 110; blood-pressure, systolic 112, diastolic 95; pulse-pressure, 17. Respiration about 12 per minute, very irregular. Pulse tracing No. 1 taken.

Not being able to get the patient to swallow anything, 20 grains calomel were put in mouth and rubbed into mucous membrane. Strychnine, $\frac{1}{20}$ grain, with 10 minims 1: 1000 solution adrenalin, were given hypodermically, and this was followed in short time by 1 quart normal salt solution by hypodermoclysis and 1 quart by rectum.

The strychnine and adrenalin made so little impression that it could not be detected, but within a couple of hours after the administration of the salt solution the

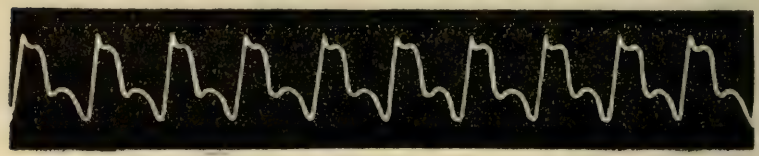
pulse showed considerable increase in volume and the patient was not so stupid, but when he was aroused he was delirious. Four hours from the time of giving the salt solution, the kidneys acted freely.

The principles of treatment heretofore outlined in this chapter for anemic cases were carried out in this case, with the addition of ½ grain of cocaine every four hours as a respiratory stimulant, but it required four days to so cleanse the system of the toxic matter that material improvement in his condition could be noticed. It was extremely difficult to get the patient to swallow anything and this prevented the free use of saline cathartics. Dry calomel by the mouth and strychnine hypodermically finally stimulated the secretory and motor functions to such a degree as to be followed by free action of the emunctories. Saline solution and sparteine kept the kidneys acting, and each day the patient was brought to a somewhat safer condition.

On the fourth day from beginning of treatment, after the bowels had acted quite freely, the blood-pressure record was as follows: systolic, 105; diastolic, 80; pulse-pressure, 25; pulse rate, 100. While this was a decrease in both systolic and diastolic pressure, the increase in the pulse-pressure, indicating more nearly normal arterial tension, was in harmony with the generally improved condition of the patient in other respects. The deep stupor had given way to a condition of lassitude from which the patient could be aroused to take nourishment, etc., and when so aroused would make intelligent answers to questions propounded to him. So long as he was fully awake and his attention attracted to anything his mind was clear, but when left to himself he would lapse into semisleep, his mind would wander, and he would talk to imaginary persons.

From this condition there was gradual improvement, until three days later the stupor had entirely disappeared and his mind was clear at all times. At this time the following record was taken: pulse rate, 90; respiration, 16; blood-pressure, systolic 125, diastolic 95; pulse-pressure, 30. Pulse tracing No. 2, made at this time, shows the character and volume of the pulse.

The record in this case is in entire accord with the author's experience in treating patients of this type. When the blood-pressure instrument showed a marked divergence from the normal relation between the systolic



Tracing No. 2.

and diastolic pressure, and this divergence indicated abnormally low arterial tension, the delirium developed more gradually; was of less violent type, usually intermitting in character; ran a more chronic course, and was at least temporarily relieved by the action of remedies such as strychnine and adrenalin, which increase arterial tension, and the delirium disappeared entirely when the normal arterial tension was restored and maintained.

While the delirium is only a symptom of the main disorder, it is a symptom of such great importance, and so influences and overshadows other conditions present, that the entire treatment should be planned with reference to it, especially in the sthenic type of cases, since if it is left uncontrolled the patient may exhaust himself before the curative remedies can be made to act.

Most writers advise the abrupt and complete withdrawal of alcohol as soon as the patient is taken in hand, but with that the author cannot agree. In his experience there is no more certain way to precipitate or aggravate an attack of delirium tremens than to stop the alcohol at once. It is true that alcohol is one of the poisons which is causing the delirium, but it is not the principal one.

On the other hand, alcohol is an anesthetic, a paralyzer of motion and sensation. Its primary effect, lasting for several hours at least, does much more to blunt the sensibilities of the cerebral centers and lessen the delirium than it does to excite it, and does this with much less interference with the action of curative remedies than do any of the narcotic drugs so often employed.

A full drink of whisky will often allay an incipient delirium for several hours and thus give a more favorable opportunity for the action of other remedies.

The author now never completely withdraws alcohol as long as the patient has or is threatened with delirium, but merely reduces its consumption to a moderate quantity, ½ or 1 pint in twenty-four hours being allowed to those who had been consuming from 1 to 2 quarts in the same length of time. After all symptoms of delirium have subsided, alcohol is withdrawn, but not suddenly.

Patients treated after this plan rarely require hypnotics. They usually sleep naturally as soon as elimination has progressed to such an extent as to allay the delirium, but, if hypnotics are needed, then moderate doses of chloral or veronal may be used. Apomorphine in doses of $\frac{1}{30}$ to $\frac{1}{40}$ grain is a valuable and safe hypnotic in this class of patients.

Large doses of the sleep-producing and sedative drugs should not be given. It is far better to allow the patient to remain awake than to take the risk of forc-

ing sleep upon him with large narcotic doses. In the author's opinion there is no place in the treatment of this disorder for the use of opiates in any form. The sedative and hypnotic effect of a neutral bath is far preferable to effects of narcotics.

RESULTS THUS FAR OBTAINED.

The author's work for the past twelve years has been limited to the treatment of alcohol and drug diseases. For the first five years of that time the delirium tremens cases were treated according to plans advised by the leading authors, but with a mortality far too great to be satisfactory. This led to an independent study of the question, and in the course of six months the author had practically formulated the plan of treatment herein outlined.

During the seven years since this plan has been adopted, we have admitted an average of 100 alcohol cases annually. Quite a number of those had delirium when admitted and others developed it after admission, but out of the entire series of 700 cases we have only had the misfortune to lose 1 patient from delirium tremens.

This is such a pleasing contrast with our former experience that the author thinks he should be excused if he seems somewhat enthusiastic in the advocacy of his present method. Not only has the mortality been reduced to almost zero, so far as this series of cases are concerned, but the number developing delirium in the institution has been reduced to a very low point. We rarely admit an alcoholic who is on a temporary spree, but our cases consist of the most chronic type, those who have gone to the limit and are therefore forced to seek help.

Every one of those would be subject to delirium during the sobering-up period, and under the plan ordinarily pursued from 20 to 25 per cent. of them would almost certainly have developed delirium at some stage of treatment. In this series the number that developed delirium, even to the mildest degree, did not exceed 5 per cent., and in these, as a rule, that symptom was overcome within the first twelve hours of the treatment, and often in half that time. In none of the cases admitted with delirium has that symptom resisted the treatment longer than twenty-four hours and rarely longer than twelve hours.

In connection with the administration of the saline solution, gelseminine in the hyperemic cases allays the delirium by the time the full effects of that remedy are developed, if not earlier, and in the anemic cases strychnine or hyoscine does so. During the respite thus obtained the flushing and eliminating process above outlined is pushed and after that the delirium does not recur.

In the early part of this series of cases veratrum was used instead of gelseminine as a cerebral sedative and motor depressant, but with more experience the author finds that gelseminine is much to be preferred.

In the sthenic type of cases, when the delirium is active and the patient is hard to control, a large dose of veratrum, 10 to 20 minims of Norwood's tincture, or $\frac{1}{10}$ grain apomorphine will often relax, nauseate, and quiet the patient and not only do much to remove the necessity for physical restraint, but will bring about a condition favorable for the administration of other remedies and allow time for their curative effects to become established.

In the asthenic or anemic type of cases strychnine or hyoscine serves the same purpose.

So fully is the author convinced of the soundness of the principles upon which this plan of treatment is based that, in an extreme case, he would not hesitate to open a vein and allow the patient to bleed until he fainted, and then at once replace the blood lost by intravenous injection of two or three times its volume of normal salt solution. It is believed this would be an ideal step in the management of a case of that class, but thus far the author has not found it necessary to go to that extent, the less radical measures having been sufficient.

Physical restraint is mentioned only to be condemned. It should be used only to the extent which may be necessary to permit the administration of the saline solution.

To Recapitulate.

It is contended that this condition is a mixed toxemia, a drug, intestinal, and an auto- toxemia, and that the virulence and activity of the poisons in the blood are increased by the progressive loss of fluids, with a diminished intake of same.

That the difficult and labored heart action is largely due to the decreased volume of circulating medium. That a leading factor in the immediate causation of the delirium is an hyperemia of the brain in a large majority of the cases and an anemia of the brain in a small per cent. of them. In the treatment it is essential to differentiate these in order to intelligently apply remedies to control delirium.

The first indication, that of support of the vital functions, so far as the heart is concerned, is most effectively provided for by the administration of normal salt solution and by sparteine. These agents, at the same time, are the most effective means of promoting free action of the kidneys. They also contribute in no small degree

to meeting the second and third indications, that of control of delirium and elimination of the poison from the blood.

In the hyperemic cases gelseminine, and in the anemic cases strychnine, by regulating the supply of the blood to the brain, at least temporarily restores a tranquil condition, in which the eliminating organs can be made to respond to purgatives and diuretics, which are the principal curative agents.

CHAPTER XXVI.

TREATMENT OF ACUTE AILMENTS OCCURRING IN ALCOHOLIC SUBJECTS.

In the treatment of any acute ailment it is well to ascertain whether or not that ailment has occurred in one who is otherwise well and sound, or whether it has occurred in one who is suffering from some other ailment, either acute or chronic.

Any ailment occurring in a person who is suffering from some pre-existing disease is materially influenced by such disease, and, in turn, the pre-existing disease may be, and often is, materially aggravated by the occurrence of the acute ailment.

Chronic alcoholism has not been generally recognized as a disease in the sense that that word is ordinarily used, but the time has come when the profession is ready to so classify it. Its existence in any person certainly intensifies any acute ailment with which that person may be attacked. Every acute ailment occurring in an alcoholic subject must be considered as being gravely complicated by the coexistence of the alcoholic condition. If the acute ailment be of an inflammatory type, it is intensified to a greater degree than if it is non-inflammatory, and the prognosis is rendered correspondingly more grave.

There are several types of chronic alcoholism, and these types affect any intercurrent disease differently; that is to say, such acute intercurrent disease is likely to show complications differing in type, that difference depending on the type of alcoholic subjects in which it occurs.

In beer and wine drinkers heart complications are more likely to occur than in those who drink stronger forms of alcoholic beverages. It has been shown by Krehl and others that beer drinkers develop hypertrophy of the heart to a much greater degree than do the drinkers of stronger forms of alcoholic liquors. The next in frequency to show such hypertrophy are the wine drinkers.

Any acute ailment puts an additional amount of work on the heart, and this is likely to break the compensation, which usually exists, in the hypertrophied heart of beer or wine drinkers, and this break in compensation often proves to be the complication which terminates the patient's life.

In those who drink the stronger forms of alcoholic liquors, there is more likely to be an acutely dilated heart, accompanied by extreme weakness. This is often more marked in periodic drinkers than in regular drinkers. True hypertrophy of the heart does not often exist in this type of alcoholics, but there is frequently almost complete exhaustion of heart power; in fact, in all forms of chronic alcoholism, the power of the heart and the reserve forces on which its action depends are extremely low; therefore, this organ must not only be watched, but supported, uniformly supported, from the very beginning of any acute ailment occurring in a chronic alcoholic subject.

It has been taught from the earliest dawn of history that alcohol is a stimulant, but it is now known that it is not a stimulant in any stage of its action. Neither is it a food, but, on the other hand, it is a protoplasmic poison, a depressant, an anesthetic, an anodyne, a narcotic, a paralyzer of sensation, motion, and intellect. It is not appropriated by the system to the repair of waste,

or to the building up of tissue, but is oxidized to render it less poisonous and to prepare it for excretion.

Alcohol depresses the inhibitory centers governing heart action, thus allowing the excitomotor function to be carried on without the inhibiting and regulating control of these centers. Because of this decreased inhibition, the heart acts extravagantly and expends what reserve energy there may be; therefore, when called upon to do any extra work it is totally unprepared to meet the emergency.

At the beginning of treatment of any acute ailment it is well to ascertain, as definitely as possible, the condition of every vital organ and to estimate, as accurately as may be, the chances of that organ holding out to do its work during the time such acute ailment is expected to exist.

If the vital organs are found to be in good order and in condition to work as normal organs, then the prognosis is more favorable, but where such organs are found to be structurally diseased, or materially impaired by overfunctional activity, the chances for recovery are very much reduced.

In the chronic alcoholic the heart may be compared to an animal. One who starts on a journey on a fresh, stout horse can calculate with reasonable certainty to make that journey safely and on time, but if he starts out on a horse that is already jaded, one which has already exhausted his reserve strength, he will not likely succeed in making the journey safely, if at all, and certainly not on time.

In the chronic alcoholic the heart is in the same condition as the jaded horse: it has already been on a long journey, has been overworked, and is, therefore, not in a condition to do normal work, much less to do the extra

work incident to an acute ailment. Therefore, if this journey is to be made with safety, every particle of work which can be taken off this jaded heart must be taken off, and even then we may not be able to give it enough relief to enable it to go to the end in safety.

All forms of alcoholic drinks interfere with and decrease the elimination of waste, and also are toxic *per se;* therefore, the system of every person using alcohol to any extent whatever is in a toxic condition. The degree of this toxic state depends upon the extent and length of time during which the alcoholic drinks have been employed.

The presence of this toxic matter interferes with the functional activity of every organ in the body, and the existence of these toxins in the blood greatly aggravates any intercurrent disease, especially of an inflammatory type. In fact, it imparts to the inflammatory condition an erysipelatous nature, a disposition to spread with great rapidity and to increase in severity to the most intense type.

This disposition to increase rapidly and spread extensively continues so long as this toxic state is allowed to continue; therefore, an alcoholic subject attacked by any inflammatory disease is likely to reach a dangerous point in a very short time, and the mortality is extremely high. This is true in traumatic as well as other forms of inflammatory disease.

In order to successfully treat any acute ailment occurring in an alcoholic subject, the toxic condition incident to the use of alcohol must be vigorously treated and overcome; otherwise, the acute disease will be much aggravated if not rendered fatal.

In such conditions one cannot wait for the restorative forces of nature to overcome the acute ailment. The

expectant plan of treatment simply means to sit by and allow the patient to be killed by the two ailments co-existing, whereas, had the system been in normal condition, and only attacked by a single acute ailment, the restorative forces of nature might have been sufficient to carry the issue to a favorable termination. The physician who would successfully treat any acute ailment in a chronic alcoholic subject must act promptly and vigorously, to the end that the patient's system be free from toxic matter incident to the alcoholic condition, and thereby be given a chance to rally its forces to combat the acute ailment.

The stomach is another organ which is always materially impaired in alcoholic subjects, and this impairment differs somewhat in beer drinkers from that which is found in those who use a more concentrated form of alcoholic beverage. Beer drinkers consume large quantities of fluid, and usually eat frequently and inordinately, and this results in an overdistention of the stomach.

This type of alcoholic patients usually have chronic dilatation of the stomach, with descent of that organ to a greater or less degree. There also exists the catarrhal conditions which are common to all chronic alcoholics, but the catarrhal condition is usually more marked in alcoholic subjects who use the more concentrated forms of alcoholic drinks. There is also a more intense degree of catarrh in those who drink regularly than there is in those who drink periodically.

The existence of the conditions above outlined renders the prognosis of any acute ailment occurring in an alcoholic subject much more grave than the same ailment occurring in one not an alcoholic subject. These, however, are truisms generally known and accepted by

all physicians, but the burning question is: What can be done to overcome these complications and bring the patients to a successful convalescence? Can this toxic condition of the system be so overcome during the acute ailment as to neutralize and negate its effect on the course of the acute ailment?

This can usually be done, but, in order to do it, the patient must be intelligently and vigorously treated for his alcoholic toxemia as well as for the acute ailment. If one ignores the existence of so important a complication as the toxic condition incident to the use of alcohol and merely treats the acute ailment as he would such an ailment in one not an alcoholic subject, he is simply riding for a fall and his patient will almost certainly be carried to an untimely grave.

The principles upon which the alcoholic toxic state can be successfully treated are sufficiently outlined in the chapters on Alcoholism, and the reader is referred to them for the details of such treatment. The author simply wishes to say here that it is best for the physician to forget the fact, if possible, that the patient has an acute ailment, and to look at the condition rather than any disease.

Thorough, conservative, but persistent elimination, both by the kidneys and bowels, as outlined in the chapter on the Treatment of Alcoholism should be applied to the treatment of these cases, and then such other suitable remedies as are indicated to meet the acute ailment should be given. In other words, the physician must take absolute control of every vital function, and not only see that the eliminating organs act promptly and efficiently, but, in addition, he must control and support the heart, lungs, and every other function upon which animal life depends.

The work of the heart is greatly increased by the toxic state of the system, and, since this toxic state uniformly results in portal congestion, thorough purgation induced by purgative courses, which stimulate all the functions concerned in the evacuation of waste, proportionately and at the same time, is the first and most essential step in overcoming the alcoholic toxic state, and it is frequently the most thoroughly indicated and most important step in the treatment of the acute ailment.

The author, however, would impress, upon anyone attempting to treat acute ailments in a patient of this type, the fact that a saline cathartic cannot be depended upon to thoroughly empty the intestinal canal and disengorge the portal system. These agents merely empty the colon and leave the upper digestive tract to retain whatever pent-up matter there is in it. He would also insist upon the proposition that no single purgative course is sufficient to remove the obstruction usually found in the portal system of such cases. Purgation must be continued, day after day, until that work is thoroughly done. However, this should be done by remedies which act conservatively, to the end that the patient's strength may be preserved as much as possible. The author has found the following purgative course to act efficiently in such cases:—

℞ Calomel,
Extract of cascara .....āā gr. x.
Podophyllin,
Ipecac .....āā gr. j.
Atropine sulphate ..... gr. 1/50.
Strychnine nitrate ..... gr. 1/30.

Make 4 capsules. Sig.: One every two hours until 4 are taken.

This, as all other purgatives, should be given on an empty stomach. If free evacuation of the bowels does not occur within eight hours from the time the last of the above capsules were given, a full dose of castor oil or a saline cathartic should be given. However, this should be preceded by the administration of $\frac{1}{20}$ grain strychnine. A purgative course similar to the above should be repeated forty-eight hours from the time the first course was given, and then such additional evacuants should be given as the condition seems to demand.

Among the complications which are to be expected is delirium tremens. The cleansing of the system of toxic matter reduces the danger of delirium, but, to further guard against it, the alcoholic drinks should be continued for a time during the acute ailment. It must be remembered that an attack of delirium tremens is frequently precipitated by the suppression of the use of alcohol, and, as the occurrence of delirium tremens during the course of any acute ailment would be a most serious complication, it is best to continue the use of alcohol until the danger of such complications has passed.

The only reason, however, for continuing the alcoholic drinks during any part of acute ailment is for its temporary sedative effects and for the purpose of avoiding delirium tremens. The author a number of years ago discarded alcohol from his armamentarium, and now never uses it in an acute ailment in one not an alcoholic subject; however, when an acute ailment occurs in an alcoholic subject, that state demands the continuation of the alcohol until the system is so cleansed from toxic matter as not to be in danger of the developing delirium tremens.

But as soon as that danger is passed, then the author would urge the importance of discontinuing the use of

the alcohol, because it is a paralyzer of motion and sensation, interferes with the inhibitory control of the heart, and allows that organ to act erratically and extravagantly, and to expend, prematurely, any latent energy which the system may have. It is not a stimulant and cannot in any way contribute to the support of the patient.

So long as there is a toxic condition of the system present, the sedative effects of alcohol, that is, its paralyzing effects on the central nervous system, are the best means that can be employed in alcoholic subjects to make the nervous system tolerate the presence of the toxic matter without undue rebellion.

The use of alcohol for this purpose does not interfere with the action of the eliminating organs so greatly as does the use of any other narcotic; and since the eliminating organ must be made to act promptly and thoroughly in order to overcome the toxic condition, all forms of opiate or restrictive remedies of that type are contraindicated, whereas the alcohol itself does not so materially interfere with the action of eliminating remedies. It is the best sedative that can be given in such cases, but it should be continued for that purpose and that purpose only.

It should not be necessary, however, to keep up the alcohol longer than four or five days. By that time the system should be so cleansed of the toxic matter that the alcohol should be gradually and rapidly withdrawn. It is not necessary to give the alcohol in such large quantities as the patient may have been taking before he was attacked by the acute ailment, but if he was drinking, say, 1 or 2 quarts of whisky per day 1 or 1½ pints would be a sufficient quantity to have all the sedative effects on the nervous system that is usually required.

However, in case delirium is threatened it is better to give the alcohol in larger quantities, if necessary to control that symptom. The central nervous system may also be held in check by the administration of gelseminine, veratrum, or other motor depressants. These give material aid in preventing an attack of delirium tremens.

The indications for treatment as the author sees them in such patients are:—

First, to overcome the toxic condition which is present in all chronic alcoholics.

Second, to relieve the portal engorgement.

Third, support the heart, this to be done persistently and systematically.

Fourth, prevent complications, such as delirium tremens.

Fifth, treat any feature of the acute ailment which has not been overcome by the measures employed against the toxemia.

Purgation, above referred to, usually meets the first two indications, that of freeing the system of toxic matter, and that of overcoming the portal congestion; also in removing the obstruction to onward flow of the blood-current it lessens the work of the heart and, therefore, materially aids that organ to do its work.

But there are certain remedies which can be used to great advantage, and which give the heart direct and dependable support. For this purpose, sparteine sulphate is, in the author's judgment, by far the most satisfactory agent. This remedy adds tone to the heart muscles and dilates the arterial capillaries in such a way as to reduce the resistance to the onward flow of the blood-current and is therefore a true heart tonic, a generator of heart force. It also materially improves the action of the kidneys, and this assists in overcoming the toxic condition.

Strychnine is a remedy not well borne in this class of patients, and it is liable to precipitate an attack of delirium tremens; therefore, it should not be routinely employed, and not at all where there is any tendency to delirium.

Sparteine, caffeine, normal salt solution, digitalis, adrenalin, and strophanthus are all remedies which may be used for the support of the heart without danger of establishing delirium tremens from their effects, but strychnine usually cannot be so used.

The support of the heart should be begun from the very beginning, as there is always a weak heart, whether it be due to loss of compensation or to exhaustion from overwork. At times there is abnormally low blood-pressure with a dilated heart, and in such cases digitalis and adrenalin prove to be the most effective cardiac supportives. But where arterial tension is more nearly normal, caffeine, sparteine, and normal salt solution are much to be preferred. While digitalis adds tone to the heart muscle, it also powerfully contracts the arterial capillaries, thus raising blood-pressure, and this probably adds as much resistance to the onward flow of the blood-current as its effect on the heart muscles adds to the tone of that organ. Therefore, it is doubtful whether or not it is really a heart tonic, but in cases where there is low arterial tension it is an ideal remedy.

As a respiratory stimulant, the author has found cocaine the most dependable remedy of the entire list. He has usually administered it in ¼- to ½- grain doses at intervals of from two to four hours, and, in many cases where the respiration was persistently embarrassed, this symptom had entirely disappeared upon the administration of the cocaine, and had not reappeared as long as the system was uniformly kept under the influence of that remedy.

INDEX.

Abortion, threatened, as cause of addiction, 311
Abstinence symptoms avoided by treatment, 64
cannot be long concealed, 33
cause of, 12
Accidental causes of morphinism, 22
Accommodation, effects of opiates on, 29
Acid, hydrochloric, excess of, due to underconsumption, 394
excess of, not the pathology, 394
Acute ailments, how influenced by use of drug, 336, 337
in alcoholic subjects, 494
indication in treatment, 503
use of alcohol during treatment of, 501
treatment of, in drug habitués, 336
Addiction, history of, in physicians, 27
formed, at times, without any element of dissipation or other blameworthy motive, 27
how formed, 287
justifiably formed, 309
time required to confirm, variable, 23
After-treatment does not consist of administration of drugs, 197
alcohol in, bad effects of, 56
strychnine in, bad effects of, 56
Age, advanced, affects progress favorably, 280
not bar to treatment of addiction, 137
Alcohol, a depressant, 495
appetite for, leads to use of, 444
Alcohol, dangerous for ex-drug habitués, 283
dangers of, De Quincy, 360
dependence of habitué on, 455
immediate withdrawal, dangerous, 466, 477
mental attitude of patient important factor, 455, 457
not a stimu ant, 497
retards elimination, 497
routine treatment not successful, 473
useful in delirium tremens, 489
Alcoholic subjects, acute ailments in, 494
prognosis of acute ailments in, 494, 498
treatment of acute ailments in, 494
Alcoholism, acute, treatment of, 447
advantages of institutional treatment, 456
as seen by a surgeon, 467
bad environment leads to, 443
by B. C. Keister, 463
by C. A. McBride, 469, 473
by Chas. A. Rosenwasser, 465
by Howard A. Kelly, 467
catarrh of the stomach, treatment of, 450, 451
chronic, a disease, 434, 461, 473
classification of, 435
curability of, 463, 466
delirium in, 476
details of treatment of, 447, 450
emetic treatment objectionable, 459
etiology, 435, 437
gelseminine in, value and use of, 449

Alcoholism, home life not favorable for treatment, 457
home treatment a fallacy, 458
ichthyol in, 451, 455
in treatment, patients must be individualized, 473
instability of character leads to, 443
moral cowardice leads to, 442
Norman Kerr's views, 461
periodical, 440
principles of treatment of, 445
prognosis in different classes, 439
regular drinkers, 435
structural lesions of, 463, 465
three-day cure of, a fallacy, 458
treatment of, in secrecy not advised, 456
some cases simple, some difficult, 447, 546
what constitutes rational treatment, 460
Ambition, inordinate, leads to morphinism, 20
Anemic type of delirium tremens, 478, 479
Animal food should be taken at one meal a day, 265
Antipyretic effects of quinine in drug patients, 234
Antipyretics, useless and helpful ones, 48
Antitoxin, none available, 57
Apomorphine in delirium tremens, 489
Appetite, a creature of cultivation, 265
after withdrawal of opiates, 49
for alcohol leads to use of, 444
grows by what it feeds upon, 265
not safe guide to needs of system, 265
Arterial tension high, 109
reduced by treatment, 109, 110, 121, 122
Aspirin, a reliable antipyretic, 226, 227
Aspirin, in drug cases, 230
use and value of, 48
Atropine a valuable addition to purgatives, 155
aids strychnine in inducing peristalsis, 157
effect on intestinal motion, 155, 156
habitués show great nervousness, 36
users of, in constant motion, 37
Author's method of treatment of delirium tremens, 476
Authors, responsibility of, 192
Automatic element of habit, 5

Beer and wine drinkers differ from other alcoholics, 495
Belladonna, effect on intestinal motion, 155
Bertrand, Dr., published first case of hypodermic addiction, 2
recommended hypodermic administration of morphine in 1836, 2
Bile, toxicity of, 58
Bismuth, with test-meal, radiograph, 163
Blood, circulation of, forces governing, 236, 237
in morphinism, 8
Blood-pressure, during treatment, 122, 127
high on admission, 99
in asthenic type of delirium tremens, 485
modified by treatment, 99, 100
Bowel, difficulty in securing action of, 101
motor function of, greatly impaired, 52
overdistention of, avoided, 154
practically normal evacuation of, artificially induced, 153
Brain- or nerve- lesion not pathology of addiction, 7

Cannon, conclusions as to movement of colon, 164

Case reports in detail, 10, 81, 85, 91, 93, 100, 111, 129
Catarrh of the stomach, alcoholic, treatment of, 450, 451
Cells, the ultimate, toxins in, 47
Cerebral sedatives in delirium tremens, 483
Character, defective traits, increased by the use of drug, 319
instability of, leads to alcoholism, 443
leads to morphinism, 20
Chemical stimulation of secretion, 145
Child in uterus an habitué, 324, 325
Children born of opium-using mothers, 328
administration of drug to, 330
can be saved, 333
how saved, 333
management of, 328, 329
mortality of, 331
Chloral addiction, 24
Chloroform addiction, 25
Chronic alcoholism, 434
a disease, 461, 473
classification of, 435
Cinchonism readily induced by inunction with glycerol of quinine, 232
Circulation, forces governing, 236, 237
Cocaine, dangers of use, 426
abrupt withdrawal of, 428
habit, 425
prognosis of, 431
treatment of, 428
habitués, behavior of, 35, 36
in carbonated drinks, 427
mode of use, 425
not substitute for morphine, 433
one who uses dangerous, 426
prolonged sleep follows withdrawal, 429
Cocaine and morphine, combined use of, 428, 433
Codeine addiction essentially the same as any other opiate, 3
Coercion not necessary, but hurtful, 43
Coffee and tea hurtful, 284
Cold pack, advantage of, 195
Colic following the withdrawal, cause of, 13
Collapse, cause of, 44
Colon, ascending motility of, 164
office of, 165
Comparison of results, 97
Comradeship with other convalescents, advantage of, 197
Concealed morphinism in parturient women, 324, 325
Condition of blood in delirium tremens, 481
Confidence of patient, means of securing, 296, 297
Congenital morphinism, 324
Control of delirium essential in delirium tremens, 488
in anemic cases of delirium tremens, 484
Convalescence shortened and made more certain, 55
Conviction, lack of, leads to morphinism, 31
Courage and conviction essential qualities to enable physician to succeed in drug cure, 71
Cowardice, moral, leads to morphinism, 20
"Craving" for narcotics a "straw man," 407
elements of—Jennings, 383, 387
overcome by proper treatment, 54
Crittenden's dietary, experiments of, 273
Crother's condemnation of hyoscine, 103, 108
Crucial test of narcotic addiction, 32
Curability of alcoholism, 462, 466
Cure, desire for, of drug users, 322, 323

Cure is not complete when drug is withdrawn, 65
permanency of, what is necessary to, 65, 275
time required for, 181
what constitutes, 178, 181

Daturine, action of, 170
duration of effect of, 170
effect of, on mucous membrane, 170
Daturine and hyoscine compared, 170
De Quincy's writings led to use of cruder forms of opium, 6
popularize and increase habitual use of opiates, 1
Degeneracy, erroneous opinions as to, 321
Delirium during treatment, how controlled, 103
tremens, sudden suppression of alcohol likely to cause, 489
anemic type, 478, 479
apomorphine in, 489
author's method of treatment, 476
blood-pressure in asthenic type, 485
cerebral sedatives in, 485
classification of cases, 478
condition of blood in, 481
control of delirium essential, 488
control of delirium in anemic cases, 484
control of delirium in hyperemic cases, 482
elimination principal curative factor, 480
gelseminine in, 479
hyoscine in, 479
hyperemic type, 478, 479
hypnotics in, 489
in hyperemic type, stimulants increase delirium, 479
indication of treatment recapitulated, 492
indication to be met in treatment, 476
Delirium tremens, morphine in, 479
mortality should be low, 490
mortality under usual treatment, 477
normal salt solution in, 480
pathology, 476
per cent. of hyperemic cases, 479
pulse tracings showing arterial tension restored, 488
pulse tracings showing low arterial tension, 486
purgatives in, 480, 481
results of treatment, 490
strychnine and hyoscine indicated in anemic cases, 484
strychnine in, 479
support of heart in, 481
use of alcohol in, 489
veratrum in, 491
Dependence of habitué on alcohol, 455
Depletion avoided by properly compounded purgatives, 157
Diarrhea, cause of, 44
if not prevented, exhausts patient, 91
modes of preventing, 91
Diet during convalescence, 261
erroneous teachings as to, 49, 50
liberal, raises blood-pressure, 118
low calorie, best for drug patients, 265
examples of, 273
tests of, 273
proper proportion for, 267
study of, by Fletcher, 273
Dipsomania, 441
Direct stimulation of secretion and motion, 146
Discharge, time for, 182
Dissipation, use of opiates rarely begins as such, 306
Drug, demand for, continued use due to toxic state caused by drug, 6
desire for, overcome, 78

Drug, heroic efforts to stop use of, 313, 314
habitués desire to be cured, 294, 295
lack of faith in other drugs, 285
necessary to habitués, 303
often combined by habitués, 34, 35
Drug addiction among physicians, mode of development and reason for, 40
both mental and physical ailment, 293
curability of, 293, 295
from acute ailment, 131
in pregnant women, 128, 129
long-standing, 232
Drug users, attitude of profession toward, 190
many retain good reputation, 308
misjudged, 305
not all untruthful, 16
should be quininized when, 234
untruthfulness of, due to other causes than drug, 16
Dumb-bells, objections to, 238, 239
Duration of addiction affects prognosis, 281, 282
not material, 139

Electric stimulation of motility and secretion, 150
Elimination and time cure addiction, 88
details of, 59, 60, 61
origin of, in treating drug cases, 195
principal curative factor in treatment of delirium tremens, 480
Emetic treatment objectionable in treatment of alcoholism, 459
Environment, bad, leads to alcoholism, 443
Ergot, Livingston's claims for, 229
an unreliable remedy, 229
Erlenmeyer, writings of, 362, 365
Erroneous claims of Lott, 73
Errors in method, 285
in pathology, 286
Excretion, deficient, causes many complications, 44
Excretion and secretion, influence of drug on, 338
Exercise, time for taking, 242

Failure in treatment, some reasons for, 285
Fever following withdrawal, cause explained, 12, 14
how controlled, 48
Flesh, newly acquired, an encumbrance if not converted into muscle, 198
Fletcher, dietary practice, 273
Food, much more than necessary consumed, 274
substance, classes of, 262
value of, in calories, 268, 269, 270, 271
Formulæ for purgative, 166
Functional disease, existence of, only recently admitted, 8

Games, advantages of, 197, 198
Gelseminine, dose of, 224
a cerebral sedative, 224
a motor depressant, 224
full effects of, 225
in alcoholism, value and use of, 449
in delirium tremens, 479
General hospital not suitable place for patients, 64
Glandular stimulants, large quantities, not required, 53
Glycerin, the proper vehicle for quinine inunction, 231
Glycerole of quinine, valuable therapeutic agent, 332
formulæ for, 233
Gradual reduction, cause of relapse, 290
dangerous nature of, 286
effect of, on mind of patient, 289
fallacy of, 290

Gradual reduction, leading feature of, 289
method indorsed by most writers, 39
perpetuates addiction, 291

Habit defined, 5
how overcome, 6
-producing drugs defined, 6
Habitual use of drug only as symptom of real condition, 6
Hare's claims, effects of, 78
reviewed, 77
inadvertent claims, 76
Heart action, deficient, due to portal engorgement, 54
during treatment, 112, 114
effect of treatment on, 56, 57
following withdrawal, 46
labored, a deficient cause of, 44
sustained by treatment, 113, 121, 130, 135
break of compensation in acute alcoholism, 495
lesion not bar to treatment of addiction, 135
overtaxed by heavy-weight exercise, 239
support of, in delirium tremens, 482
Hepatic colic, large doses of morphine required in, 71
Heroin addiction established same as other opiates, 3
longer time required to form, 4
Hertz, action of salines, 162
Home of patient not place for treatment, 195
treatment of alcoholism a fallacy, 458
Hydrochloric acid in drug cases, 227
not present in excess, 398
often deficient after withdrawal, 228
prevents hyperacidity from fermentation, 228
underconsumption of, 398
Hyoscine addiction, 24
Hyoscine, administration to infants, 327
administration to pregnant women, 135
aids in restoring mental activity, 172
as secretory stimulant, 171, 172
dose for infant, 327
effect on respiration, 169
effects of prolonged administration, 184
erroneous ideas as to use of, 72
excessive use of, 173, 179
great intolerance for, 82, 86
habitual tolerance for, 87
length of time required in drug cases, 87
no fixed dose, 55
not an antidote for morphine, 94
office and value of, 75
prolonged administration, sometimes causes intolerance for, 95
scopolamine, action of, 168
susceptibility to, varies greatly, 79
toxic effects of, examples, 80, 81
use in delirium tremens, 479
when to be given, 62
Hyperemic type of delirium tremens, 478, 479
Hypnotics, use in delirium tremens, 489

Ichthyol, in alcoholism, 451, 455
mixture, formulæ for, 454
physiological effects of, 453
Immediate withdrawal of alcohol in delirium tremens, 489
Immorality forced by withholding drug supply, 316
Inadvertent formation of addiction defined, 22
Indication to be met in treatment of delirium tremens, 476
Indications in treatment of acute ailments in alcoholic subjects, 503

Instability of character leads to alcoholism, 443
Institution, advantages of, in treatment, 193
best place for convalescence as well as for treatment, 49
Intestinal contents, downward passage of, 146
motion suspended by morphine, 14
excited by strychnine, 153
Inunction a prompt and reliable method of securing effect of quinine, 232
Itching of nose caused by opiates, 31

Jennings, Oscar, elements of craving, 303
opinions of, 379, 381
writings of, 369, 377
Judgment, a plea for a more just, of narcotic drug users, 303
Justifiable use of morphine, 19, 20

Keister, B. C., on alcoholism, 463
Kelly, Howard A., on alcoholism, 467

Lambert, Alexander, comments on writings of, 415, 424
objections to teachings of, 423, 424
views of, 407
Literature, review of, 347, 401
Lott, credit erroneously given to, 74
painless cure, examples of, 74
Lott's claims reviewed, 77

Malarial complications, how managed, 99, 100
Massage of abdomen excites peristalsis, 148
McBride, C. A., on alcoholism, 469
McBride's surgical treatment of alcoholism, 473
Meals for drug patients, examples of, 264
Measurements for body of men, 241
of women, 241
Meat diet not best for drug and alcoholic patients, 265
Mechanical devices for physical exercise, 258, 260
stimulation, benefit of, 397
of motor and secretory functions, 147
substitute for drug stimulation, 38
Mental attitude of patient important factor, 445, 447
impression, effect of, 291
state dominates men, 292
Mental condition of drug patients, development of, 288
element of drug cases, management of, 296
impression, power, and duration of, 291, 299, 300
Mind, effects of hyoscine on, 186, 187
Mode of use, influences, time required to confirm addiction, 23
Mood, variability of, in drug users, 30
Moral cowardice leads to alcoholism, 442
purpose, lack of, leads to morphinism, 21
Morphine, effect of, on nervous system, 13
contraindicated in delirium tremens, 479
disease defined, 3, 4
effects of habitual use of, on conception, 16
on perception, 15
on system analyzed, 12, 15
essential nature of, 3, 4
from proprietary nostrums, 22
habit, opium habit, use of term condemned, 5
inadvertently formed, 22
its discovery and hypodermic use, addiction, 2
its use in delirium tremens, 479, 490
not a vice, 10
not an antidote for hyoscine, 94

Morphine, use of, in hepatic and renal colic, 20
withdrawal from infants, 328
withdrawal of, from infant, 327
Morphine addiction, mechanism of formation, 12
time required to form, 18
Morphine and atropine habitués nauseated by morphine, 37
"Morphine fiend," use of term condemned, 321
Morphinism a disease, 191
defined, 3, 4
Morphinist compared with morphinomania, 4
Mortality should be low in delirium tremens, 477
under usual treatment of delirium tremens, 477
Motive fixes moral quality of act, 321
Motor function of intestine chiefly impaired, 339, 341
Muscles, alternate tension and relaxation of, 238
Muscular tension, effect of, 238

Narcotic addiction, complications during treatment, 52
crucial test for, 52
essential pathology of, 52
Narcotics, use of, conditions predisposing to, 18
Nausea and vomiting, as abstinence symptom, 14
Nerve- and brain- lesion not pathology of narcotic addiction, 7
Nerve-centers profoundly lethargic, 53, 153
mechanism of, stimulation of, 156
Neutral bath, value of, 195
Non-habit-producing drugs defined, 6
Normal salt solution, its use in delirium tremens, 480

Oily substance not fit vehicle for quinine inunction, 231
Opiates, use of, does not beget degeneracy, 307
withdrawn during convalescence from acute ailment in which addiction is formed, 130
Opinions, the holding of certain, unfits physician for treating drug cases, 194
Opium habit, morphine habit, use of term condemned, 5
Opium habitués rarely ever sneeze, 31
Osler's "Modern Medicine," extract from, 404
Overconfidence in powers of self-control leads to addiction, 20, 26
Overeating dangerous for drug patients, 262
Overwork leads to addiction, 25

Pain during convalescence, how avoided, 45
Pains of opium, De Quincy, 354, 359
Pathogenesis of drug habit, 7
Pathology, erroneous views of, 39
of delirium tremens, 76
of narcotic addiction, 7, 9
Peristalsis essential to bowel movement, 339
mechanism of, 152
normal, 152
normal, artificially induced, 153
suspended by primary effects of opiates, 59, 152
Personality of physician important factor in treatment of drug patients, 302
Perspiration, excessive and irregular, indicates addiction to narcotics, 32
toxicity of, 58
Physical ailments which contribute to use of morphine, 19

Physical examination of patients, objects of, 297
restraint damaging, 314
training, 235
examination before, 239
modified forms of, necessary, 235
physiological effect of, 236
preparation for, 239
value of, in drug cases, 235
Physicians largely responsible for addiction, 22, 23
Physiological effects of ichthyol in alcoholism, 453
stimulation of secretion and motion, 150
Pilocarpine as an antipyretic, 225
hypnotic, 226
may cause nausea, 226
use and value of, 49
use of, in drug cases, 225
Pleasures of opium, De Quincy, 347, 352
Portal engorgement important factor in causing complication, 44
must be overcome before withdrawal, 44
Pregnancy not bar to treatment of addiction, 128, 129
withdrawal during, 325
Prognosis, favorable in majority of cases, 278, 279
heretofore considered unfavorable, 278
in drug cases, 275
influenced by origin of addiction, 277
by duration of addiction, 282
Psychic state, patients in, action on suggestion, 300
may be induced by scopolamine or hyoscine, 300
nature of, 300
patients in, do not reason, 300
Public opinion, errors of, 307
influence of drug user on, 306
Pulse of morphine habitué in state of want, 217
Pulse of morphine habitué restored by morphine, 210
by sparteine, 210
Pulse tracings, during treatment, 110, 114
in morphinism, 109, 110
showing arterial tension restored in delirium tremens, 488
showing low arterial tension in delirium tremens, 486
Pupil, effects of cocaine on, 29
of hyoscine on, 29
of opiates on, 29
Purgative for narcotic habitués, 157
Purgatives for pregnant women, 128, 129
in delirium tremens, 480, 481
principles upon which they act, 142, 145
repetition of, 61, 62
schematic diagram for, 158
unphysiological, 413
unpleasant effects of, on drug habitués, explanation of, 68
Purge, a physiologically balanced, 59
physiologically balanced, defined, 157

Quinine an antipyretic, 234
by inunction, 230
in drug cases, 229, 230
in large doses a sedative in certain conditions, 234
inunction essentially a chemical process, 232
principles governing, 231

Reduction method, damaging effect of, 279
of doses, how and when to be made, 61
Reflex stimulation, local, 144
not sufficient to excite efficient peristalsis in drug cases, 53
Relapse, must be fortified against, 197
Relapses, other causes of, 283

Relief, demand for immediate, cause of drug habit, 10
the most frequent cause of, 282
Reputation of drug users, how formed, 319
Resistance work, details of, 243
effect of, on circulation, 236
effect on nutrition, 236
Respiration, deep abdominal, excites peristalsis, 149
Restraint not helpful, 181, 182
Review of literature, 347, 401
Rosenbery, excessive use of hyoscine, 173, 174
Rosenwasser, Chas. A., on alcoholism, 465
Routine treatment not possible, 65
not successful in alcoholism, 473

Saline cathartics, action of, 161
solution, value and use of, 81, 82
time of passage through intestines, 163
Scopolamine, causes "psychic" state, 300
dose of, 55
effect on heart, 169
effect on intestinal motion, 155
effect on respiration, 169
office and value of, 75
proper therapeutic use does not perpetuate demand for opiates, 54
when to be given, 62
Scopolamine and daturine, compound, 170
Scopolamine, hyoscine, identity of, 168
Secretion, secondary stimulation of, by hyoscine, 72
stimulants, large doses not required, 53
Secretory function, stimulation of, 144, 145
Self-defense prompts denial of addiction, 321
Self-recovery no tendency in drug addiction, 140
Selfishness leads to morphinism, 21
Simplex exerciser, 258, 260
Skin, effects of opiates on, 31
Sleep, produced by hyoscine, 62, 63
produced by scopolamine, 62, 63
Sneezing rare in opium habitués, 31
Sodium bicarbonate, use of, by Jennings, 391
explanation of effects of, 395
Sodium hyposulphite, use of, 63
Sparteine, a true and reliable heart tonic, 202
adds tone to heart muscle, 202
as a non-irritating diuretic, 213, 218
comparative value of, 218
compared to digitalis and veratrum, 201
corrects irregularities of heart action, 202
decreases blood-pressure, 203, 205
dose of, 199, 200
duration of effects, 201
effect on capillary circulation, 218
on blood-pressure, 201, 202, 205
in acutely dilated heart, 215
in pneumonia, 212
in postoperative suppression, 218
is the alkaloid of Cysticus scoparius, 217
Jennings's study of, 208
no hurtful after-effects, 212
non-toxic drug, 200
overcomes venous stases, 212
pain from, reduced by slow injection of dose, 223
physiological effects of, 201, 202
promotes healing after operation, 219, 222
promptness of action, 201
reduces postanesthetic nausea, 219 222
reduces heart strain, 212
reduces surgical shock, 219, 221

Sparteine succeeded when digitalis and strychnine failed, 214
under some conditions increases pulse rate, 204
usually slows heart action, 203, 204
valuable in surgical work, 219
Specific of Lambert not a specific, 410, 411
Stimulants increase delirium in hyperemic type of delirium tremens, 479
Stomach, digestive capacity of, after withdrawal, 49
should be empty before giving purge, 159
should be protected from overwork, 264
should not be overtaxed after withdrawal, 49
Strength of patient, necessity and method of consuming, 58
Structural lesion of alcoholism, 463, 467
in morphinism not demonstrable, 7
Structural pathologists, effects of their treating, 8, 9
Strychnine, after-effects of, 66, 67
an essential ingredient in purgative, 53
failure to administer in sufficient doses brings failure in treatment, 69, 70
in delirium tremens, 479
in large doses may be given, 67
in sufficient doses will excite peristalsis in opium habit, 53
larger than medicinal doses required, 66
quantity required in drug users, 340
susceptibility or intolerance for, 65
how determined, 65
tolerance for, explained, 66
Strychnine and atropine, effect of, on intestinal motion, 156
Strychnine and hyoscine indicated in anemic cases of delirium tremens, 484
Suffering during treatment should be avoided, 55
during and after withdrawal, how prevented, 45
Suggestive treatment, value of, 298
Supervision during convalescence needed, 49
Support of heart in delirium tremens, 481
Surgeon's views of alcoholism, 467
Susceptibility to hyoscine varies greatly, 79
Sympathy damaging during convalescence, 195
Symptomatic treatment of morphinism a fallacy, 9
Symptoms of gradual reduction described by Dr. Wilson, 37
during convalescence, 45, 47
indicating deprivation, 37
indicating use of opiates, 29
indicating use of other drugs with opiates, 34
of gradual reduction described by Erlenmeyer, 38
of morphinism, 28
of sudden pressure, 41, 42
which develop under gradual withdrawal, 30

Teachings of Lott and Hare, 88, 89
Temperature, following withdrawal, cause of, 13, 14
rise of, from withdrawal of drug, 13, 14
Tobacco, use of, hurtful, 284
Toxemia, acute intestinal, almost unavoidable, 118, 119
effect of, 119
example of, 118
treatment of, 120
Toxic diathesis an element in habitual use of narcotics, 6
Toxicity of urine, 58

Toxin, elimination of, only remedy of, 57
Toxins, complex nature of, 57
Treatment, details of, 60, 64
long-continued damaging, 290
modification of, 98
obsolete ideas as to, 405
of addiction more than mere practice of therapeutics, 302
of morphinism, 183
older methods, 285, 286
principles of, 51, 54
principles of, by Jennings, 387
safety of, shown by pulse-tracings and blood-pressure records, 98
to be successful must correct mania of patient, 290
Turkish baths, suggested by Jennings, 392
Types of drug users, 315, 316

Untruthful, drug users not all, 16
Untruthfulness not due to effects of drug alone, 16
other influence than drug cause of, 16
Use, longest continual, of morphine, 139
Use of alcohol during treatment of acute ailments, 501, 502
in delirium tremens, 489

Value and use of gelseminine in alcoholism, 449
Veratrum in delirium tremens, 491
Veronal in drug cases, objections to, 228
Vice, narcotic addiction erroneously so classed, 10

Waugh suggested use of calomel, 193
Weight, too rapid increase, an encumbrance, 50, 91
Withdrawal, condition following, 303, 305
Erlenmeyer's rapid method, 365
symptoms accounted for, 11, 13, 304
without danger or severe suffering if patient is properly prepared, 43, 44
without elimination, examples of, 370

Youth, affects prognosis unfavorably, 280, 281

Zigzag or tacking course of cocaine habit, 34, 35

University of California
SOUTHERN REGIONAL LIBRARY FACILITY
405 Hilgard Avenue, Los Angeles, CA 90024-1388
Return this material to the library
from which it was borrowed.

allied ailments. . .

MEDICAL SCIENCES LIBRARY
UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA 92664

A 000 541 153 3

NOTE :